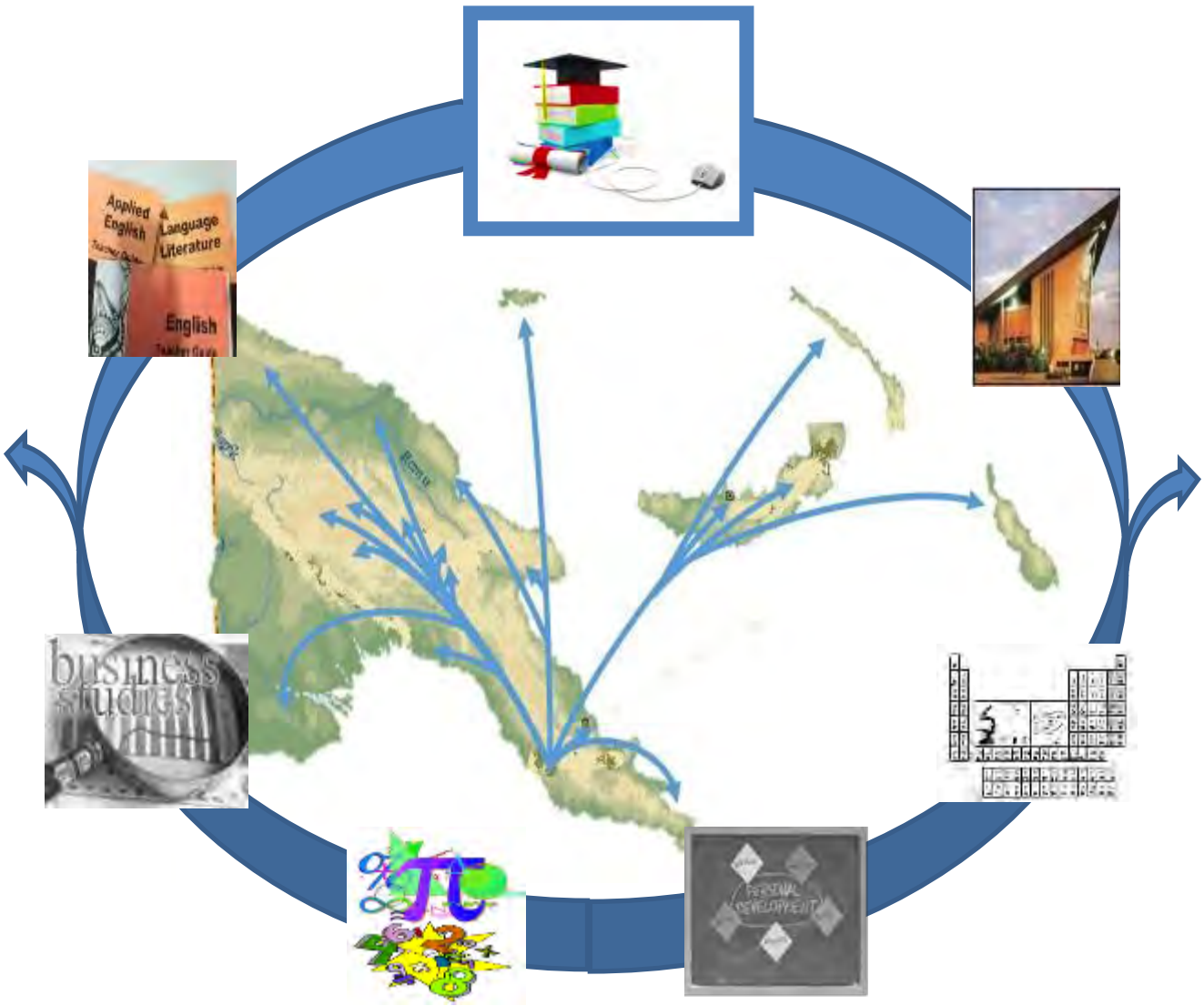
DEPARTMENT OF EDUCATION

GRADE 11

INFORMATION COMMUNICATION TECHNOLOGY

MODULE 5 – DATABASE 1



FODE DISTANCE LEARNING

Writers and Editors

Maria Imelda Somtragool

Writer

Dr. Janet S. Marcelo

Cleofe Dagale

Diana Akis

Judy Mirou

Martha Pitpit

Editors

GRADE 11

INFORMATION COMMUNICATION TECHNOLOGY

UNIT MODULE 5

DATABASE 1

TOPIC 1: WORKING IN ACCESS

TOPIC 2: WORKING WITH DATA

TOPIC 3: WORKING WITH TABLES AND RELATIONSHIPS

TOPIC 4: QUERIES AND FORMS

Acknowledgements

We acknowledge the contribution of all Secondary and Upper Primary teachers who in one way or another helped to develop this Course.

Our profound gratitude goes to the former Principal of FODE, Mr. Demas Tongogo for leading FODE team towards this great achievement. Special thanks are given to the staff of the Information Communication Technology Department-FODE who played an active role in coordinating writing workshops, outsourcing of lesson writing and editing processes involving selected teachers in NCD.

We also acknowledge the professional guidance and services provided through-out the processes of writing by the members of:

Information Communication Technology Subject Review Committee-FODE
Academic Advisory Committee-FODE
Information Communication Technology Department- CDAD

.
This book was developed with the invaluable support and co-funding of the GO-PNG and World Bank.

DIANA TEIT AKIS
Principal-FODE

Published in 2017

ISBN: 978-9980-89-675-9
National Library Services of Papua New Guinea

Compiled and finalised by: Information Communication Technology Department-FODE

Printed by the Flexible, Open and Distance Education

CONTENTS

SECRETARY'S MESSAGE

Achieving a better future by individual students, their families, communities or the nation as a whole, depends on the curriculum and the way it is delivered.

This course is part and parcel of the new reformed curriculum – the Outcome Base Education (OBE). Its learning outcomes are student centred and written in terms that allow them to be demonstrated, assessed and measured.

It maintains the rationale, goals, aims and principles of the National OBE Curriculum and identifies the knowledge, skills, attitudes and values that students should achieve.

This is a provision of Flexible, Open and Distance Education as an alternative pathway of formal education.

The Course promotes Papua New Guinea values and beliefs which are found in our constitution, Government policies and reports. It is developed in line with the National Education Plan (2005 – 2014) and addresses an increase in the number of school leavers which has been coupled with a limited access to secondary and higher educational institutions.

Flexible, Open and Distance Education is guided by the Department of Education's Mission which is fivefold;

- to facilitate and promote integral development of every individual
- to develop and encourage an education system which satisfies the requirements of Papua New Guinea and its people
- to establish, preserve, and improve standards of education throughout Papua New Guinea
- to make the benefits of such education available as widely as possible to all of the people
- to make education accessible to the physically, mentally and socially handicapped as well as to those who are educationally disadvantaged

The College is enhanced to provide alternative and comparable pathways for students and adults to complete their education, through one system, many pathways and same learning outcomes.

It is our vision that Papua New Guineans harness all appropriate and affordable technologies to pursue this program.

I commend all those teachers, curriculum writers, university lecturers and many others who have contributed in developing this course.

UKE KOMBRA, PhD
Secretary for Education

UNIT 5: DATABASE 1

INTRODUCTION

Microsoft Access is a computer application used to create and manage computer-based databases on desktop computers and/or on connected computers (a network). Microsoft Access can be used for personal information management (PIM), in a small business to organise and manage data, or in an enterprise to communicate with servers.

Access 2010 is a database application design and deployment tool that you can use to keep track of important information. You can keep your data on your computer, or you can publish on the Web — so others can use your database with a web browser.

If you have a Microsoft Access database such as an E-Mail attachment, a file on a disk, on the network, or in any other means, once you see its icon, you can double-click it.

Not only will this action launch Microsoft Access, but also it will open the file.

You can also launch Microsoft Access from a shortcut. If you happen to use the software on a regular basis, you can create a shortcut on your desktop or on the Quick Launch area.

If you are working on a network of related computers, your database may be located in another computer. In this case the network or database administrator would create a link or shortcut to the drive that is hosting the database. You can then click or double-click this link or shortcut to open the database and, as a result, launch Microsoft Access.

The following icons are used in this module:

 Student Aims

 Student Activity

 Time Frame

 Note

 Practical Student Activity

 Answers to Learning Activities

Student's Learning Outcomes

On successful completion of this module, students will be able to:

- understand how databases work and how they are implemented in businesses and organisations
- collect and organise data to manipulate reports, forms and queries
- describe and set up a simple local area network (LAN)
- describe communications hardware, software and methods of connection
- describe suitable data protection and security procedures for a network.

Time Frame

This unit should be completed within 10 weeks.

If you set an average of 3 hours per day, you should be able to complete the unit comfortably by the end of the assigned week.

Try to do all the learning activities and compare your answers with the ones provided at the end of the unit. If you do not get a particular exercise right in the first attempt, you should not get discouraged but instead, go back and attempt it. If you still do not get it right after several attempts, then, you should seek help from your friend or even your tutor. Do not pass any question without solving it first.

11.5.1 Working in Access

11.5.1.1 Starting Access

Microsoft Access is a pseudo-relational database engine from Microsoft. It is part of the Microsoft Office suite of applications that also includes Word, Outlook and Excel, among others.

Microsoft Access 2010 is a database application design and deployment tool that you can use to keep track of important information. You can keep your data on your computer, or you can publish to the Web — so others can use your database with a web browser.

The basic interface—such as the Quick Access Toolbar, the ribbon, the Backstage view, and dialogue boxes—should be familiar if you have used other Office 2010 programs. However, Access has more dimensions than many of those programs, so it might seem more complex until you become familiar with it.

The Development of Microsoft Access

Access offers a variety of features for different database needs. You can use it to develop the general types of applications:

Personal applications

Small-business applications

Departmental applications

Corporation-wide applications

Front-end applications for enterprise wide client/server databases

Web applications

1. **Access as a development platform for personal applications**

   At a basic level, you can use Access to develop simple, personal database-management systems. Some people automate everything from their wine collections to their home finances. One thing to be careful of is that, Access is easy to use. Its wonderful built-in wizards make Access look like a product that anyone can use. Application switchboards that enable you to easily navigate around your application, data-entry screens, reports and the underlying tables that support them.

   Microsoft first released Access, many people asked whether the author was concerned that her business as a computer programmer and trainer would diminish because Access seemed to let absolutely anyone write a database application. Although it is true that you can produce the simplest of Access applications without any thought for design and without any customisation, most applications require at least some design and customisation.

2. **Access as a Development Platform for Small-Business Applications**

Access is an excellent platform for developing an application that can run a small business. Its wizards let you quickly and easily build the application's foundation. The ability to create macros and to build code modules allows power users and developers to create code libraries of reusable functions, and the ability to add code behind forms and reports allows them to create powerful custom forms and reports.

The main limitation of using Access for developing a custom small-business application is the time and money involved in the development process. Many people use Access wizards to begin the development process but find they need to customise their applications in ways they cannot accomplish on their own. Small-business owners often experience this problem on an even greater scale than personal users. The demands of a small-business application are usually much higher than those of a personal application. Many doctors, attorneys, and other professionals have called the author after they reached a dead end in the development process. They are always dismayed at how much money it will cost to make their application usable. An example is a doctor who built a series of forms and reports to automate her office. All went well until it came time to produce patient billings, enter payments, and produce receivable reports. Although at first glance these processes seem simple, on further examination the doctor realized that the wizard-produced reports and forms did not provide the sophistication necessary for her billing process. Unfortunately, the doctor did not have the time or programming skills to add the necessary features. So, in using Access as a tool to develop small-business applications, you must be realistic about the time and money involved in developing anything but the simplest of applications.

3. **Access as a Development Platform for Departmental Applications**

Access is perfect for developing applications for departments in large corporations. Most departments in large corporations have the development budgets to produce well-designed applications.

Fortunately, most departments also usually have a PC guru who is more than happy to help design forms and reports. This gives the department a sense of ownership because it has contributed to the development of its application. If complex form, report design, or coding is necessary, large corporations usually have on-site resources available that can provide the necessary assistance. If the support is not available within the corporation, most corporations are willing to outsource to obtain the necessary expertise.

4. **Access as a Development Platform for Corporation-Wide Applications**

Although Access might be best suited for departmental applications, you can also use it to produce applications that you distribute throughout an organization. How successful this endeavor is depends on the corporation. There is a limit to the number of users who can concurrently share an Access application while maintaining acceptable performance, and there's also a limit to the number of records that each table can contain without a significant performance drop. These numbers vary depending on factors such as the following:

How much traffic already exists on the network?

How much RAM and how many processors the server has?

How the server is already being used? For example, are applications such as Microsoft Office being loaded from the server or from local workstations?

What types of tasks the users of the application are performing? For example, are they querying, entering data, running reports, and so on?

Where Access and Access applications are run from (the server or the workstation)?

What network operating system is in place?

The author's general rule of thumb for an Access application that is not client/server-based is that poor performance generally results with more than 10 to 15 concurrent users and more than 100,000 records. Remember that these numbers vary immensely depending on the factors mentioned and on what you and the other users of the application define as acceptable performance. If you go beyond these limits, you should consider using Access as a front end to a client/server database such as Microsoft SQL Server—that is, you can use Access to create forms and reports while storing tables and possibly queries on the database server.

5. **Access as a Front End for Enterprise wide Client/Server Applications**
   A client/server database, such as Microsoft SQL Server or Oracle, processes queries on the server machine and returns results to the workstation. The server software cannot display data to the user, so this is where Access comes to the rescue. Acting as a front end, Access can display the data retrieved from the database server in reports, datasheets, or forms. If the user updates the data in an Access form, the workstation sends the update to the back-end database. You can accomplish this process either by linking to these external databases so that they appear to both you and the user as Access tables or by using techniques to access client/server data directly.

6. **Web Application**
   An Access 2010 offers many new features and improvements. The improved integration with SharePoint Server 2010 via Access services allows for MS Access 2010 database to be published to SharePoint, which enables multiple users to interact with the database from any standards compliant Web browser.

History of Database Software

Databases originated in the 1960's with the development of computers designed to manage large business data sets. The term **data base** was used in the 1960's until the single word, **database**, became popular in the 1970's (The Linux Information Project, 2006). The concept of a desktop computer database did not develop until after the 1970's with the development of personal computers. A personal computer (PC) was a term used to differentiate a computer designed for use of an individual, rather than a business organization.

Early Relational Database Development

Two early PC relational databases were dBase and FoxPro. DBase was developed in 1978 by Wayne Ratliff, a programming contractor at the Jet Propulsion Laboratory in Pasadena, California (Martel, n.d.). Ratliff developed the database to win the office football pool (Unarchived, 2012). He ran the program on his kit-built home computer. Early PCs were kit-

built for users as a hobby. Later, Ratliff collaborated with George Tate to create a company and market the software. DBase was very popular during the 1980's and later sold to Borland in 1993. DBase began to lose popularity as competition database software was released to the marketplace.

The development of Windows with a graphical user interface (GUI) forced developers to redesign software. In the early 1990's all developers were scrambling to use GUI. Paradox was designed for Windows by a different team of programmers. Paradox for Windows was released in 1993 two months after the release of Microsoft Access, which had already had taken hold in the marketplace.

The Importance of Using a Database

Databases store information in electronic records that may be searched, retrieved and organised in countless ways. Having your information in a database, instead of on paper or on spreadsheets, not only saves you time and preserves vital information, it allows you to see patterns in your operations that are visible in no other way.

1. Substantial Time Savings

Databases save time. Retrieving a single record, which may take several minutes of digging in a paper-based filing system, can be done with just a few clicks in a computerised database. Merging database records with documents makes producing paper reports almost instantaneous, eliminating hours of retyping. Data entry screens can be designed to let you see related records as you create a new one, so you do not have to spend time wading through other records to check spellings, addresses, historical data, such as previous sales.

2. More Accessible Information

Databases give you lots of different ways to look at your data. A request for a specific answer or list from your database -- called a "query" -- can take just a minute or two to write, as opposed to hand-collating data records or sorting and resorting a spreadsheet. Plus, you can write standing queries to answer the questions you ask frequently, so an up-to-the-minute answer is just seconds away.

3. Ability to Link Data

Databases allow you to link different sources of information together so you can see important things about your business you may never have noticed before. Linking your sales records and your expense reimbursement accounts, for instance, allows you to see whether an increase in client entertainment really does result in more closed deals. Connecting professional development and production data allows you to see which training courses actually increase your productivity. Information sources that have traditionally been sequestered in separate departments can come together in a database to reveal surprising and profitable insights.

4. Ability to Drive Mail, Email and Social Networks

Mass customisation -- the ability to provide an individualised response to thousands or even millions of potential customers -- depends on electronic databases to analyse customer information and generate tailored messaging. Data records can drive direct mail and email campaigns to your customers, and can even help you stay abreast of who is saying what about your product on social networks like Twitter and Facebook.

Major Parts of a Database

A database is used to store and retrieve data. The database is housed in a database server and largely controlled by a database management system. All SQL based databases, whether they are MS SQL Server, MySQL, Oracle, or Progress has several components in common.

- **Tables**
  Tables are used to store data within the database. They are its main component and without them, the database would serve little purpose. Tables are uniquely named within a database. Many operations, such as queries use these names. Typically a table is named to represent the type of data stored within. For example, a table holding employee data may be called Employees. A table consists of rows and columns. The columns are defined to house a specific data type, such as dates, numeric, or textual data. Each column is also given a name. Continuing with our example, an employee's name may be defined in the table as two columns as FirstName and LastName.
- **Indexes**
  Indexes are used to make data retrieval faster. Rather than having to scan an entire table for data, an index allows the database to, essentially, directly retrieve the data being asked of it. An index consists of keys, which in most cases directly relate to columns in a table. For example, we could create an index using FirstName and LastName to make it quicker to look up employees by their name. Once common property of an index is uniqueness. If an index is unique, then it can only contain unique values for its defined keys. In our employee example, this wouldn't be practical, as a company may have more than one John Smith working at it; however, it would make sense to create a unique index on employee number.
- **Views**
  Relationships between database tables can become quite complicated as data is stored in separate tables. Views help combat this issue by allowing the database administrator to create canned or pre-built queries that developers, report writer, and users can use in their own database queries. In this way, the view hides some of the database complexity. This makes it easier to read queries; however, danger does lurk in this as it can be easy to forget the amount of processing a view represents.
- **Stored Procedures**
  There are many situations where queries alone are insufficient to solve a problem. In these cases, developers rely on programming languages to process logic, to loop through records, and perform conditional comparisons as required. These programs can be stored in the database as stored procedures. The language used to create the stored procedures are vendor specific. T/SQL is the language used by Microsoft SQL Server; whereas, PL/SQL is used by Oracle. In each case the language provides the same basic abilities, such as being able to move record by record through a query, perform if-then logic, and call special built in functions to assist with complicated calculations.

- **Triggers**
  Triggers are special instructions that are executed when important events, such as inserting or updating records in a table happen. The most common triggers are Insert, Update, and Delete triggers. Two items define a trigger on a table: a stored procedure and an event, such as inserting a record that invokes its execution. In our employee example, we may want to keep track every time an employee record is updated. To do this, you could create an update trigger which calls a stored procedure to update the affected row's modification date. Triggers are useful to ensure that data is update consistently. You don't have to rely on the user or program that originally modified the employee to also modify the date.

Microsoft Access

Microsoft Access was first released in 1992 (the same year FoxPro was purchased) for the Windows OS (Beitler, 2010). In 1993, a second version was released to be more compatible with Microsoft Office. Microsoft released additional versions of Access to be compatible with newer iterations of Windows operating systems. Access was a component of Microsoft Office Professional. Access 2010 is the most recent version of the relational database software, although 2013 version is scheduled for release in 2013. The target audience for the software continues to be small and medium-sized businesses.

The importance of Microsoft Access

Microsoft Access is an important information management tool that allows users to create databases to store various kinds of information for reference, reporting and analysis. It is a flexible program that allows the performance of simple end-user tasks as well as mission critical operations. Microsoft Access users can create tables, queries, forms and reports, and connect them together with macros. Advanced users can use programming language and its associated integrated development environment to write rich solutions with user control and advanced data manipulation.

Its original concept allowed end-users to access data from various sources. Other features include the importing and exporting of data to various formats and its ability to link to, view, query, edit and report data in its existing location. Another important benefit of Access is its compatibility with structured query language, which allows users to mix and use both VBA and macros for programming forms and logic. Access also offers queries and tables that can be referenced from other programs. Microsoft Access is a member of the Microsoft Office suite of applications included in the Professional and higher editions. It can also be integrated with other technologies such as Microsoft Excel, Outlook, Word, PowerPoint and ActiveX controls.

Activity 11.5.1.1

Perform this written activity to test your knowledge in defining Microsoft Access and its general applications in MS Access.

1. Define MS Access.

_____

_____

_____

_____

_____

_____

2. Write the general types of applications in MS Access.

a. _____

b._____

c. _____

d._____

e._____

f._____

11.5.1.2 Functions and Uses of Access

Microsoft Access 2010 is a powerful relational database that can be used to track, share and report information. It provides access to a large library of professionally designed templates; wizards that automatically create tables, queries, forms, and reports; and extensive local and online help resources.

The Uses of Database

The humble database affects almost every aspect of daily life -- from grocery store inventories and cable-TV subscriber information to marketing mailing lists and issuing payroll checks to employees. Databases are not just for big business, though. You can create a handy personal or family database to keep track of just about anything, including your video game collection, recipes, contacts, music CDs and books.

Databases for Businesses

The business world depends on databases 24 hours a day, seven days a week. Inventory, order processing, payroll, accounting, shipping and transportation routing are often tracked within a main database that keeps the company functioning.

- **Database Uses in Business**
  Small businesses run on databases. These repositories of organized information can store virtually every kind of data imaginable, and they can sort that information and deliver it to you with a click of a mouse. Business databases help small-business owners organize and track their customers, inventory and employees.

- **Customer Management**
  A customer relationship management database can help a small business manage the lifeblood of its business, its customers. A CRM (Customer Management) database organizes all the information a company has about its accounts, contacts, leads and opportunities. A single customer's record may include his contact details, the date and amount of his last order, the total amount of his purchases for the last year, a list of his favorite products and the products he returned, details of customer service calls and more. Databases can also be used to manage marketing and promotions, to export email addresses and to prepare shipping labels.

- **Inventory Tracking**
  An inventory tracking database can tell a retail business how much inventory is in a warehouse, in a storage room and on store shelves. Integrated bar codes and scanners form a complete tracking system, monitoring products as they move from one place to another and updating the database so you never need to count the inventory in a warehouse. A database can also alert you when products and supplies are running short so you can order more before you run out of an essential item.

- **Personnel Database**
  Using a database to manage employee information can simplify scheduling and help prevent payroll errors. An employee database contains such fields as hourly wage, salary or commission, tax withholding rates, year-to-date income and accrued vacation time. Other employee benefits, such as health insurance and retirement account contributions, can also be recorded in a database. Two or more databases can be

linked to each other to create an association between a sales representative in the personnel database and the accounts she is responsible for in the CRM database.

- **Analysis**
  The robust reporting features of databases make them useful resources for analyzing data and predicting future trends. For example, a productivity report might show that productivity slows so much on the Friday afternoons before a three-day holiday weekend that you may as well just let the staff go early on those days. A sales promotion effectiveness report might show that sales of certain products increased after an email promotion while sales of other products increased after an in-store promotion. Customer behavior is predictable, and a database can help you anticipate and fulfill your customers' needs.

- **Databases Are Used in E-Business**
  Databases are integral to the success of an e-business. They enable you to store, analyze and manage essential information about your products, your sales and your customers so you can quickly and easily respond to changing market conditions. You can also share information in the database with suppliers and logistics partners to improve the efficiency of your e-business operations.

- **Product Information**
  You can use your e-business database to hold and update information on your products, including detailed product descriptions and specifications, product reference numbers, prices, promotional offers and availability. You also can include details of the supplier for each product that you stock. By updating the information in the database, rather than changing and publishing individual website pages, you can save time and ensure your website always shows visitors the latest information.

- **Customer Information**
  The database should hold information on your customers, including their full names and contact details. For business customers, include the type and size of business and their industry sector. For consumers, add any personal information that would be relevant to their buying potential, such as age range, income, demographic details and interests. In certain countries, data protection legislation applies to personal information that organizations hold on a database, so ensure you comply if you sell in export markets.

- **Transactions**
  The basic customer information is important for administration of your e-business. By recording information on customers' product searches, information requests and purchases, you can also build a detailed picture of individual customers' product preferences, purchasing history and future buying potential.

- **Personalization**
  The detailed customer profiles enable you to make personalized offers to customers based on their preferences. If your website sells sportswear, for example, you could create promotional campaigns targeted at all female customers in your database who

play golf and prefer a specific brand. You can also use the database to customize prices for your larger business customers. When a customer selects a product and requests a price, the database returns the price or discount you have set for that company.

- **Campaign Management**
  You can assess the effectiveness of your marketing campaigns and product offers by analyzing the transaction information in your database and producing reports. Compare sales before and after the campaign to identify the most successful campaigns. By analyzing trends in sales of different products in your portfolio, you can make changes to prices, product mix or stock levels.

- **Self-Service**
  With the right level of security in place, you can give customers, suppliers and logistics partners access to certain areas of your database. Customers, for example, can check on their order history and delivery status of outstanding orders. By giving suppliers access to stock levels, you can help them to plan their own production schedules more efficiently. Logistics partners can check on current orders so they can plan their delivery schedules.

Databases for Education
From elementary schools to colleges, educational institutions use databases to keep track of students, grades, transfers, transcripts and other student data. There are even specialized database packages geared toward schools and colleges.

Database application development programs allow for the study of web programming and systems analysis as well as database concepts and interface design. Prospective students should already have some level of technical aptitude and computer proficiency. Students who graduate with a relevant certificate or 2 year degree should be prepared to pass the exams required to earn professional certifications.

Databases for Non-Profits
Like businesses and educational institutions, non-profit organizations use systems to track information. Many charities and other non-profit groups use a database to store details of donations, volunteers, hours served in the community, clients helped and other information related to the organization.

Databases for Household and Family Management
The humble database affects almost every aspect of daily life, from grocery store inventories and cable, TV subscriber information to marketing mailing lists and issuing payroll checks to employees. Databases are not just for big business, though. The database also has a role in household and family management. Many people use databases to keep track of family birthdays, bills and expenses in the home; addresses of friends and relatives and movie/DVD collections.

Everyday Uses For Databases

Each time you make a purchase and the sales clerk asks for your address or ZIP code, your information is kept and stored on a customer database. These collections of data are used to send mailings of special offers, discounts and other deals.

Activity 11.5.1.2

Perform this written activity to test your skills in naming the uses of database.

A. Write the uses of database in business.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

B. Databases for Household and Family Management

1. _____

2. _____

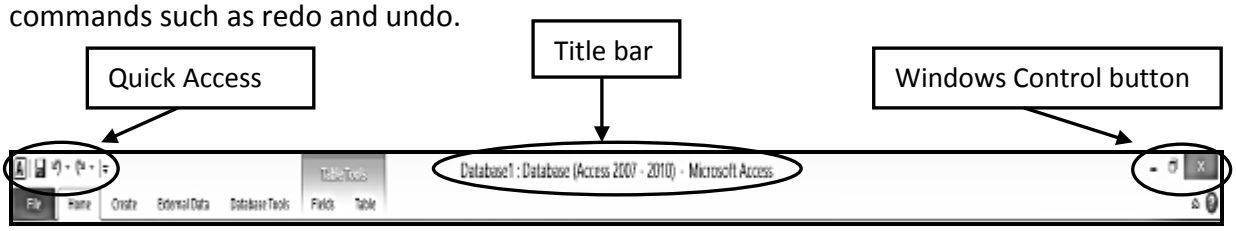
3. _____

4. _____

11.5.1.3 Parts of Access Window

Access 2010 features a user interface with significant changes from prior versions, especially versions prior to Access 2007. Two main components of the user interface - the **ribbon** and the **Navigation Pane** -were introduced in Access 2007. Several changes have been made to the ribbon, and a third user interface component — the **Microsoft Office Backstage view** — is new in Access 2010.

At the top of the working area Access has a title bar and a windows control button. On the left end of the title bar is the quick access to a bar which contains frequently used commands such as redo and undo.



Parts of Access Window

The three main components of the Access 2010 user interface are:

- **The ribbon** is the strip of tabs across the top of the program window that contains groups of commands.
- **The Backstage view** is the collection of commands that you see on the **File** tab on the ribbon.
- **The Navigation Pane** is the pane on the left side of the Access program window that lets you work with database objects. The Navigation Pane replaced the Database Window in Access 2007.

These three elements provide the environment in which you create and use databases.

1. The ribbon

The ribbon is the primary replacement for menus and toolbars and provides the main command interface in Access 2010. One of the main advantages of the ribbon is that it consolidates, in one place, those tasks or entry points that used to require menus, toolbars, task panes, and other UI components to display. This way, you have one place in which to look for commands, instead of a multitude of places.

The ribbon has main tabs that group related commonly-used commands, contextual tabs that appear only when you can use them, and the Quick Access Toolbar, a small toolbar that you can customize with your favourite commands.
On the ribbon tabs, some of the buttons provide you a gallery of choices, while others launch a command.

When you open a database, the ribbon appears at the top of the main Access window, where it displays the commands in the active command tab.

The ribbon

The ribbon contains a series of command tabs that contain commands. In Access 2010, the main command tabs are **File**, **Home**, **Create**, **External Data**, and **Database Tools**. Each tab contains groups of related commands, and these groups surface some of the additional new UI elements, such as the gallery, which is a new type of control that presents choices visually.

The Record Source

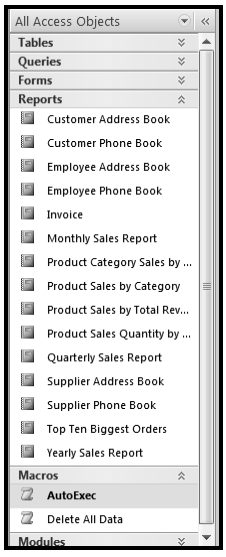
The commands that are available on the ribbon also reflect the currently active object. For example, if you have a table opened in Datasheet view and you click **Form** on the **Create** tab, in the **Forms** group, Access creates the form, based on the active table. That is, the name of the active table is entered in the new form's **RecordSource** property. Moreover, some ribbon tabs only appear in certain contexts. For example, the **Design** tab only appears when you have an object open in Design view.

You can use keyboard shortcuts with the ribbon. All of the keyboard shortcuts from an earlier version of Access continue to work. The Keyboard Access System replaces the menu accelerators from earlier versions of Access. This system uses small indicators with a single letter or combination of letters that appear on the ribbon when you press the ALT key. These indicators show what keyboard shortcut actives the control underneath.

Quick Access Toolbar (QAT)

The Quick Access

The Quick Access Toolbar is a toolbar adjacent to the ribbon that allows one-click access to commands. The default set of commands include **Save**, **Undo**, and **Redo**, and you can customize the Quick Access Toolbar to include other commands that you use often. You can also modify the placement of the toolbar and change it from the default small size to large size. The small toolbar appears next to the command tabs on the ribbon. When you switch to the large size, the toolbar appears below the ribbon and extends its full width.



The Access Objects

2. The Backstage view

The Backstage view is new in Access 2010. It contains commands and information that apply to an entire database, such as **Compact and Repair**, as well as commands that were on the **File** menu in earlier versions, such as **Print**.

3. The Navigation Pane

The Navigation Pane helps you organize your database objects, and is the main means of opening or changing the design of a database object. The Navigation Pane replaced the Database Window that was in Access versions prior to Access 2007.

The Navigation Pane is organized by categories and groups. You can choose from a variety of organizational options, and can also create your own custom organization scheme in the Navigation Pane. By default, a new database uses the Object Type category, which has groups that correspond to the various kinds of database object. The Object Type category organizes the database objects in a similar fashion to the default Database Window display from earlier versions.
You can minimize the Navigation Pane, and you can also hide it, but you cannot obscure the Navigation Pane by opening database objects in front of it.

To show or hide the Navigation Pane

Click the button in the upper-right corner of the Navigation Pane  or press F11.

Note: The Navigation Pane is not available in a web browser. To use the Navigation Pane with a web database, you must first open that database by using Access.

Status bar

As with earlier versions of Access, in Access 2010, you can display a status bar at the bottom of the window. This standard UI element continues to be the place to look for status messages, property hints, progress indicators, and so on. With Access 2010, the status bar also takes on two standard functions that you will also see in the status bar of other Office 2010 programs: View/Window switching and Zoom.

The Status Bar

You can quickly switch the active window between one of the available views by using the controls available on the status bar. If you are viewing an object that supports variable zoom, you can adjust the zoom level to zoom in or out by using the slider on the status bar.
The status bar can be enabled or disabled in the **Access Options** dialogue box.

Mini toolbar

In versions of Access earlier than Access 2007, formatting text often required using a menu or displaying the **Formatting** toolbar. Using Access 2010 you can format text more easily by using the mini toolbar.

Mini toolbar

When you select text for formatting, the mini toolbar automatically appears above the selected text. If you move the mouse pointer closer to the mini toolbar, the mini toolbar fades in and you can use it to apply bold, italic, font size, colour, and so on. As you move the pointer away from the mini toolbar, the mini toolbar fades away. If you do not want to use the mini toolbar to apply text formatting to a selection, just move your pointer a few pixels away and the mini toolbar disappears.

Getting Help

When you have a question, you can get help by pressing F1, by clicking the question mark icon on the right side of the ribbon.

Getting Help

Activity 11.5.1.3

Perform the activity below to test your knowledge to name the basic of MS Access.

A. Name and explain the three main components of MS Access.

1._____

2._____

3._____

B. Name five main command tabs of MS Access.

1._____

2._____

3._____

4._____

5._____

11.5.1.4 Saving and Exiting Access

Saving Access

If you created a database by using Microsoft Access 2010 and you want to share the database with people who are using versions of Access earlier than Access 2007, you can save the database to an earlier file format by using the **Save As** command.

Saving Access

However, Access 2010 includes a number of new features that can prevent you from saving to an earlier file format. Also, some new features cannot be used from within Access 2007, even though Access 2007 uses the same .accdb file format as Access 2010. This article outlines the basic process of converting to an earlier file format and the factors that can prevent conversion.

The default file format for both Access 2010 is the .accdb file format. In fact, when you create a new database in Access 2010, the file format displayed in the title bar is Access 2007. As a result, you can use Access 2007 to open a database that was created in Access 2010 without first using the **Save As** command. However, Access 2010 includes some new features that require Access 2010 to run.

Versions of Access prior to Access 2007 use the .mdb file format by default. In Access 2010, you can convert an .accdb file to an .mdb file, but only if the .accdb file does not contain any features that require the .accdb file format to run.

Save a copy of an .accdb file in the .mdb file format

Follow the steps below on how to save a copy of an .accdb file in the .mdb file format.

1. On the **File** tab, Click Save & Publish.
2. Under Save Database As, do one of the following:
    - To save a copy of the database in a format that can be opened by using Access 2002 or later, click Access 2002 - 2003 Database (*.mdb).
    - To save a copy of the database in a format that can be opened by using Access 2000 or later, click Access 2000 Database (*.mdb).
3. Save As. If the database contains any features that prevent you from saving it as an .mdb file, Access displays a message and prevents you from continuing.

4. In the Save As dialogue box, in the File name box, type a name for the database file, and then click Save.

Access closes the original database and opens a new copy of the database in the format that you specified. Any changes that you make to the database will only affect the new copy. To make changes to the original database, you must reopen the original database.

Note: To convert an Access 2010 database to a file format that is compatible with Access 97 or earlier, you must first use Access 2010 to convert the database to the Access 2000 file format or the Access 2002 - 2003 file format. Then use an earlier version of Access to convert the database to the format that you want.

Microsoft Access Exit

Since Microsoft Access shares the same functionality you are probably familiar with from using other applications, you can close it easily. Study the following:

- To close Microsoft Access, you can click File and then click Exit Access
- To close Microsoft Access from its title bar, you can click its Close button. 
- To close Microsoft Access like any regular window of the Microsoft Windows applications, you can press **Alt + F4**
- To close Microsoft Access using mnemonics, you can press **Alt, F, X**.

Closing Microsoft Access

- To close Microsoft Access, click on the Close button on the top right corner of the window. 

Activity 11.5.1.4

Perform the following skills in answering these written activities for saving and exiting in MS Access.

A. List down the steps when saving a copy of an .accdb file in the .mdb file format.

1. _____

2._____

3. _____

4._____

B. List down four possible applications on how to exit MS Access.

1. _____

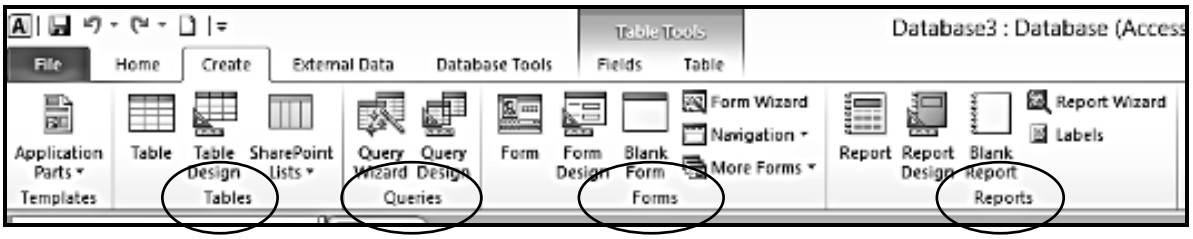
2. _____

3. _____

4. _____

11.5.1.5 Working with Database Objects

Databases in Access 2010 are composed of four objects: **tables**, **queries**, **forms**, and **reports**. Together, these objects allow you to enter, store, analyze, and compile your data as you wish.



The Database Objects

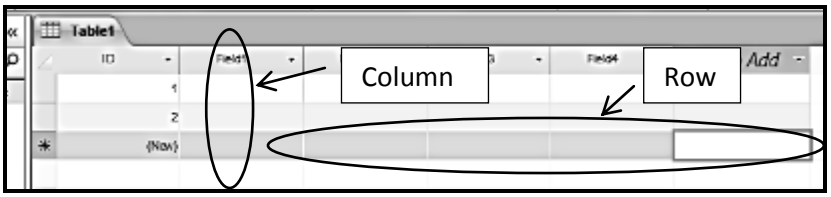
The Access objects

Tables, queries, forms, and reports are the framework for any database you create in Access. Understanding how each of these objects work will help you create a database that will be useful and help you retrieve the information you need.

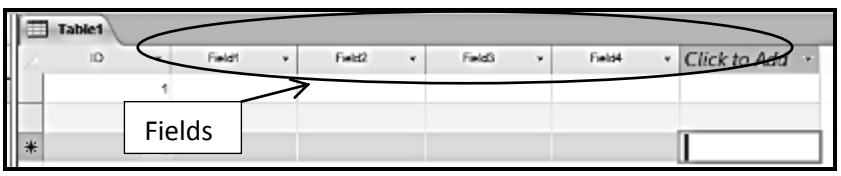
1. Tables

By this point, you should already understand that a database is a collection of data organized into many connected **lists**. In Access, all data is stored in **tables**, which put tables at the heart of any database.

You might already know that tables are organized into vertical **columns** and horizontal **rows**. In Access, rows and columns are referred to as **records** and **fields**. A **field** is more than just a column; it's a way of organizing information by the **type** of data it is. Every piece of information within a field is of the same **type**. For example, every entry in a field called "First Name" would be a name, and every entry in field called "Street Address" would be an address.

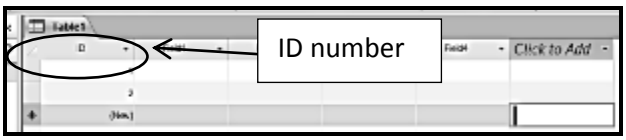


Column and Row



Fields

Notice how each record spans several fields. Even though the information in each record is organized into fields, it belongs with the other information in that record. The **number** at the left of each row is the **ID number** that identifies each record. The ID number for a record refers to every piece of information contained in that row.

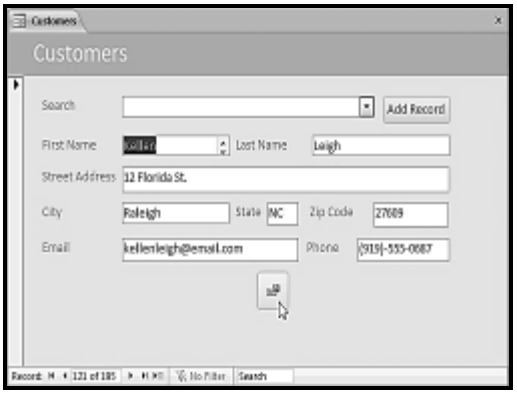


ID number

Tables are good for storing **closely related information**. Let us say you own a bakery and have a database that includes a table with your customers' names and information—their phone numbers, home addresses, and email addresses. Since these pieces of information are all details about your customers, you would include them all in the same **table**. Each customer would be represented by a unique **record**, and each type of information about those customers would be stored in its own field. If you decided to add any more information—say, a customer's birthday—you would simply create a new field within the same table.

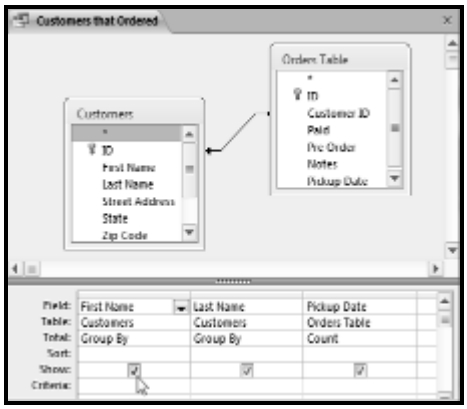
2. Forms

Forms are used for **entering**, **modifying**, and **viewing** records. You probably have had to fill out forms on many occasions, like when visiting a doctor's office, applying for a job, or registering for school. The reason forms are used so often is that they're an easy way to guide people into entering data correctly. When you enter information into a form in Access, that data goes exactly where the database designer wants it to go—into one or more related tables.



Forms

Forms make entering data easier. Working with extensive tables can be confusing, and when you have connected tables you might need to work with more than one at a time to enter a set of data. However, with forms, it's possible to enter data into multiple tables at once, all in one place. Database designers can even set restrictions on individual form components to ensure all of the needed data is entered in the correct format. All in all, forms help keep data consistent and well-organized, which is essential for an accurate and powerful database.



Qeuries

3. Queries

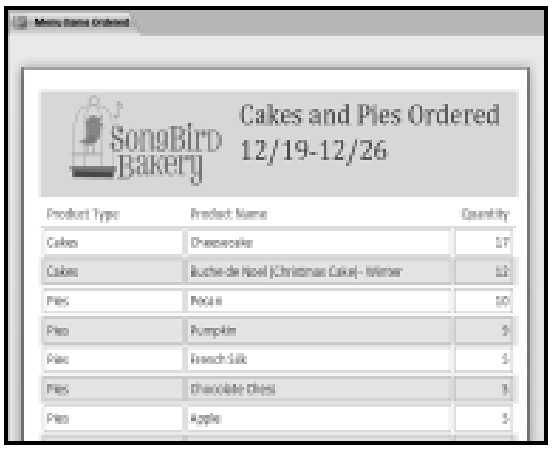
Queries are a way of **searching** for and **compiling** data from one or more tables. Running a query is like asking a detailed question of

your database. When you build a query in Access, you are **defining specific search conditions** to find exactly the data you want.

Queries are far more powerful than the simple searches you might carry out within a table. While a **search** would be able to help you find the name of one customer at your business, you could run a **query** to find the name and phone number of every customer who's made a purchase within the past week. A well-designed query can give information you might not be able to find out just by looking through the data in your tables.

4. Reports

Reports offer you the ability to **present** your data **in print**. If you've ever received a computer printout of a class schedule or a printed invoice of a purchase, you have seen a database report. Reports are useful because they allow you to present components of your database in an easy-to-read format. You can even customize a report's appearance to make it visually appealing. Access offers you the ability to create a report from any **table** or **query**.



Reports

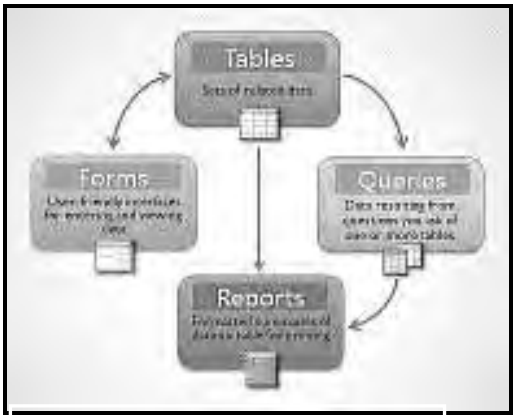
Forms, queries, and reports

Although **tables** store all of your data, the other three objects offer you ways to work with it: **forms, queries,** and **reports.** Each of these objects interacts with the **records** stored in your database's tables.

Putting it all together

Even if you have a good idea of how each object can be used, it can initially be difficult to understand how they all work together. It helps to remember that they all work with the same data. Every piece of data that a **query**, **form**, or **report** uses are stored in one of your database **tables**.

Forms allow you to both **add** data to tables and **view** data that already exists. Reports **present** data from tables and also from queries which, in turn, **search for** and **analyze** data within those same tables.

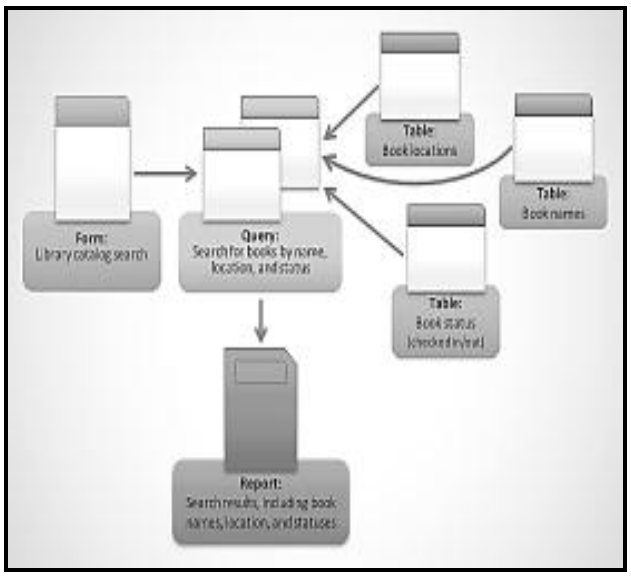


Putting it all together

These relationships sound complicated, but in fact they work together so well and so naturally that we often do not even notice when we are using connected database objects.

For example when you are searching location of books in the library; you will perform search, you were entering your search terms into a **form** that, in turn, created and ran a **query** based on your request. When the query finished searching the database's **tables** for

records that matched your search, you were shown a **report** that drew information from the query and the related tables—in this case, a list of books matching your search terms. You could represent the connections between the objects like this:



Form, query, tables and report

Imagine that instead of using these tools you had to search within a giant table containing every book in the library system. The relevant records would likely be spread out across many tables: a table for book titles and descriptions, a table containing information about which books are checked in or out, and a table with each branch of the library, just to name a few.

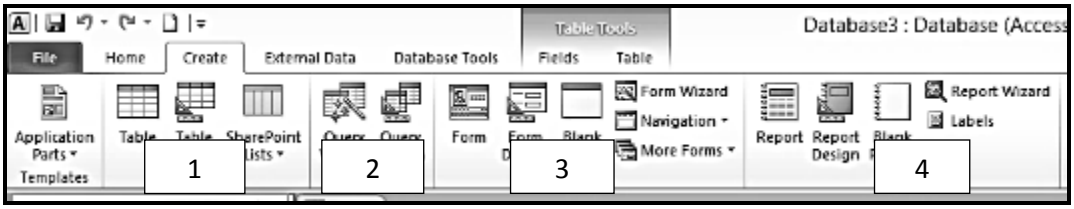
You would have to search at least three tables just to find a book, learn its location, and see whether it is checked in! It is easy to imagine how difficult it could become to find the right book. If you were not careful, you might even mess something up by accidentally deleting or editing a record. It's easy to see how the database objects make this search much more manageable.

From the previous lessons, we discussed the concept of a relational database, which is a database that is able to understand how different sets of data relate to one another. Situations like the example above are exactly why people find relational databases so useful. Without a relational database, what should be a simple task—searching for a book and seeing if it is checked in and where—becomes incredibly complicated and time consuming. Knowing how to use the four Access objects can make even complicated tasks fairly user friendly.

Activity 11.5.1.5

Perform the activity below to test your abilities to label the objects in a database in MS Access and explain some important terms in MS Access.

A. Label the four objects of a database in MS Access.



1. _____

2. _____

3. _____

4. _____

B. Explain the following words.

1. Field

_____

_____

2. Record

_____

_____

3. Forms

_____

_____

4. Queries

_____

_____

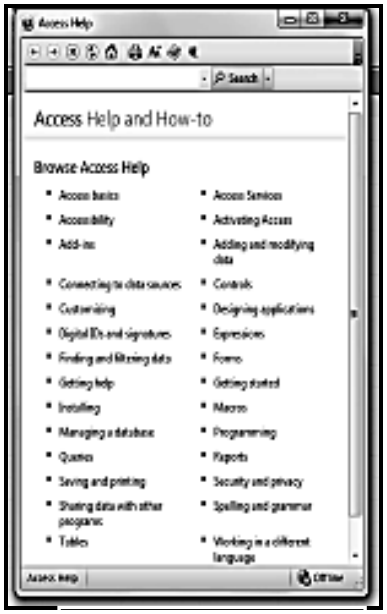
11.5.1.6 Getting Help and Maintenance

Get Help

Whenever you have a question about Access, your next recourse is the Access Help system. This system is a combination of tools and information available from the Office website for reference when you are online, and basic information stored on your computer for reference when you are offline. Online references can include articles, videos, and training tools.

To open the Access Help window and search for information:

Near the right end of the title bar, click the **Microsoft Access Help** button to open the **Access Help** window.



Microsoft Access Help

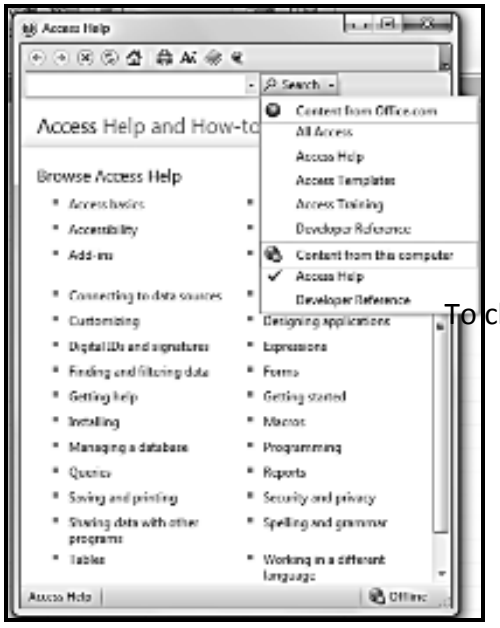
- **Keyboard Shortcut**

Keyboard shortcut can be done by pressing F1to display the Access Help Window.

Follow the steps below on how to switch between online and offline reference content:

1. Click the arrow to the right of Access Help.
2. Click Access Help From Office.com or Access Help From Your Computer.
3. To print the information shown in the Help window, click the Print button on the toolbar.
4. To change the font size of the topic, click the **Use Large Text** button on the toolbar to the left of the **Search Help** box.
5. In the search box, enter your search term,
6. Click the **Search** button (the magnifying glass) to display a list of related topics.

   In the results list, click the topic you are interested in, to display its information. Jump to related information by clicking any hyperlink identified by blue text.



Access Help

When section links appear at the beginning of an article

1. Click a link to move directly to that section of the article.
2. Click the Top Of Page link at the end of an article to return to the beginning.

- Familiar way to open Help Window if you have Classic Menu.

Classic Menu for Office brings back classic style menus and toolbar. It will enable you work in Access 2007/2010.

1. Click the **Help** drop down menu in main menus;
2. Click the **Microsoft Access Help** item.

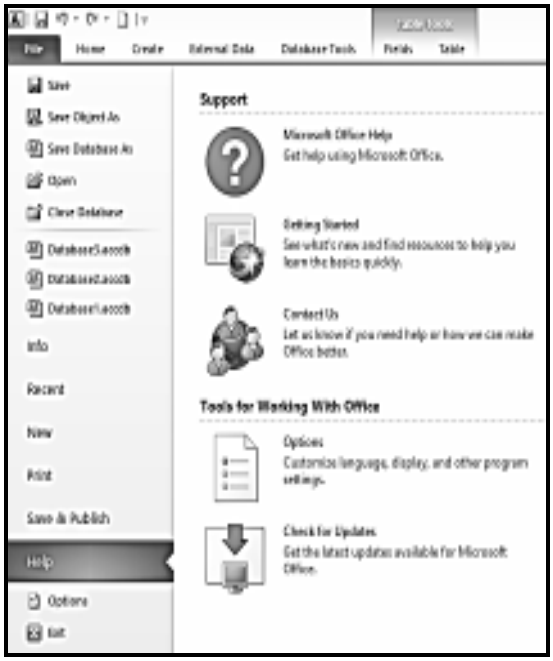
Open Help window from Ribbon if you do not have Classic Menu

It is very easy to open Help window in Microsoft Access 2007/2010/2013. Just click the help button in the upper right of Ribbon.

Help button

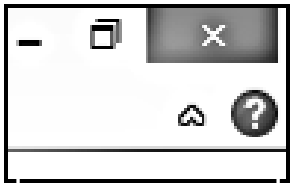
Help button in backstage view

Apart from the Help button in the upper right Ribbon, you can also get Help information from the backstage view in Access 2010. Click the Help button under File tab, you will get help information.



Help button in backstage view

When you finish exploring, close the **Access Help** window by clicking the **Close** button in the upper-right corner.



Close Button

Activity 11.5.1.6

Perform the activity below to test your skill in Access Help and window search.

1. Write on how to open the Access Help window and search for information.

_____
_____

2. Write on how to open the Access Help window using the keyboard shortcut.

_____
_____

3. Write on how to open the Access Help window using other command.

_____
_____

Summative Activities 11.5.1

A. Define the following word.

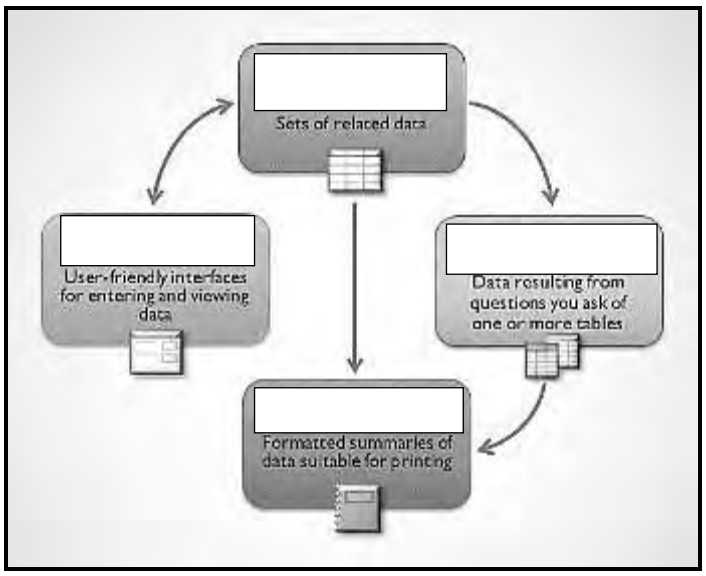
1. Backstage View

_____
_____
_____
_____
_____
_____

2. Getting help

_____
_____
_____
_____
_____
_____

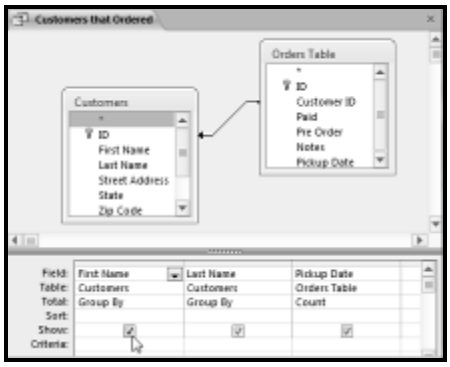
B. Label The Four Access Objects. Write your answers on the boxes provided within the diagram.



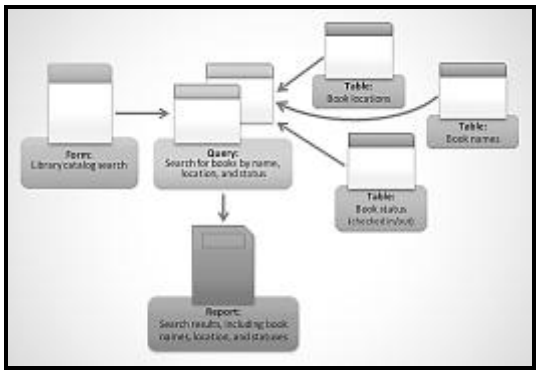
C. Name the given Access objects output

1.

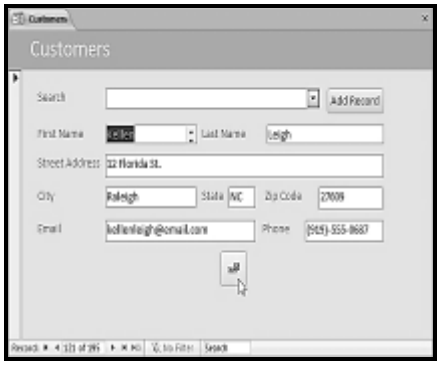
2.



3.



4.



Answers to Activities

Activity 11.5.1.1

1. MS Access
Microsoft Access is a pseudo-relational database engine from Microsoft. It is part of the Microsoft Office suite of applications that also includes Word, Outlook and Excel, among others. Access is also available for purchase as a stand-alone product. Access uses the Jet Database Engine for data storage. Microsoft Access 2010 is a database application design and deployment tool that you can use to keep track of important information. You can keep your data on your computer, or you can publish to the Web — so others can use your database with a web browser.

The basic interface—such as the Quick Access Toolbar, the ribbon, the Backstage view, and dialogue boxes—should be familiar if you have used other Office 2010 programs. However, Access has more dimensions than many of those programs, so it might seem more complex until you become familiar with it.

2. **The general types of applications in MS Access**.

a. Personal applications

b. Small-business applications

c. Departmental applications

d. Corporation-wide applications

e. Front-end applications for enterprise wide client/server databases

f. Web applications

Activity 11.5.1.2

A. Any of these answers

1. Customer Management

3. Inventory Tracking

4. Personnel Database

5. Analysis

6. Database in e-business
7. Product Information
8. Customer Information
9. Transactions
10. Personalization
11. Campaign Management
12. Self Service

B. Any of these answers

1. Grocery stores inventories and cable
2. TV subscriber information to marketing lists
3. Issuing payroll checks to employees
4. Keep track of family birthdays
5. Bills and expenses in the house
6. Address of friends and relatives
7. Movies and DVD collections

Activity 11.5.1.3

A. The three main components of the Access 2010 user interface are:

1. **The ribbon** is the strip of tabs across the top of the program window that contains groups of commands.
2. **The Backstage view** is the collection of commands that you see on the **File** tab on the ribbon.

3. **The Navigation Pane** is the pane on the left side of the Access program window that lets you work with database objects. The Navigation Pane replaced the Database Window in Access 2007.

B. The five main command tabs of MS Access.

1. File
2. Home
3. Create
4. External Data
5. Database Tools

Activity 11.5.1.4

A. Steps when saving a copy of an .accdb file in the .mdb file format.

1. On the File tab, Click Save & Publish.

Under **Save Database As**, do one of the following:

- To save a copy of the database in a format that can be opened by using Access 2002 or later, click **Access 2002 - 2003 Database (*.mdb)**.
- To save a copy of the database in a format that can be opened by using Access 2000 or later, click **Access 2000 Database (*.mdb)**.

2. Save As.
3. Type a name for the database file.
4. Click Save.

B. Four possible applications on how to exit MS Access.

1. To close Microsoft Access, you can click File and then click Exit Access
2. To close Microsoft Access from its title bar, you can click its Close button 
3. To close Microsoft Access like any regular window of the Microsoft Windows applications, you can press **Alt + F4**
4. To close Microsoft Access using mnemonics, you can press **Alt, F, X**.

Activity 11.5.1.5

A.

1. Table
2. Queries
3. Forms
4. Forms

B.

1. Field - is more than just a column; it's a way of organizing information by the type of data it is. Every piece of information within a field is of the same type**.**
2. Record - each customer would be represented by a unique record, and each type of information about those customers would be stored in its own field.
3. Forms - Forms are used for entering, modifying, and viewing records.
4. Queries - Queries are a way of searching for and compiling data from one or more tables.

Activity 11.5.1.6

1. Near the right end of the title bar, click the Microsoft Access Help button to open the Access Help window.
2. Press F1 to display the Access Help window.
3. From Backstage view in Access 2010, Click the Help button under File tab, you will get help information.

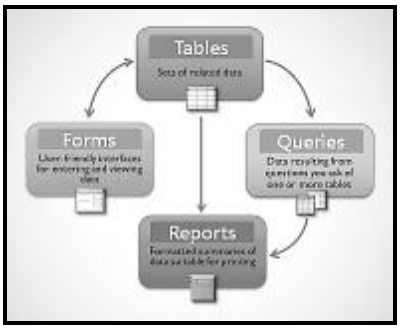
Answers to Summative Activities 11.5.1

A.

1. **Backstage View**
   The Backstage view is new in Access 2010. It contains commands and information that apply to an entire database, such as **Compact and Repair**, as well as commands that were on the **File** menu in earlier versions, such as **Print**.

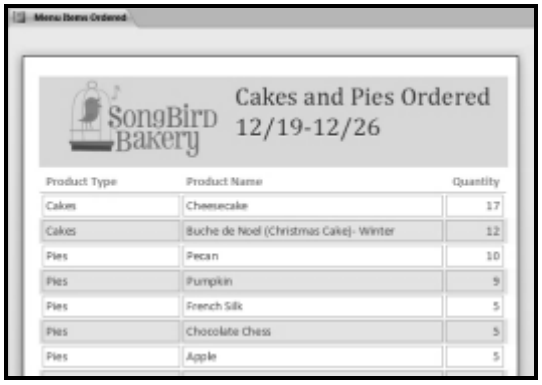
2. **Getting Help**
   When you have a question, you can get help by pressing F1, by clicking the question mark icon on the right side of the ribbon.

B. The Four Access Objects



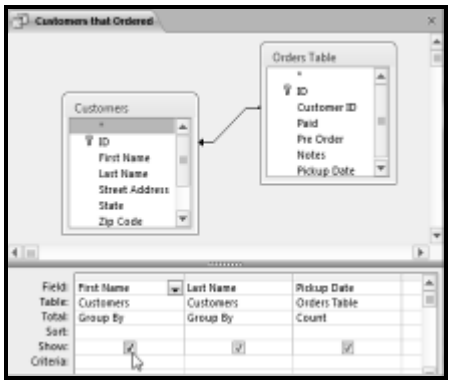
C. Name the given Access Objects output.

1.



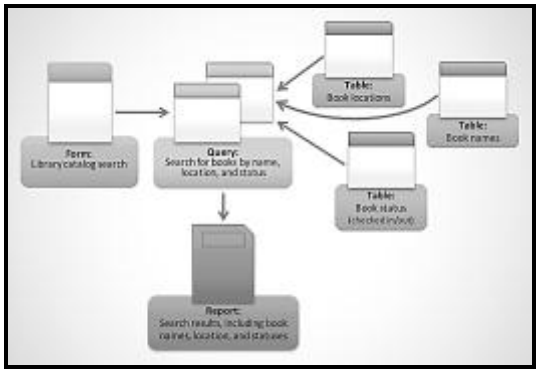
Reports

2.



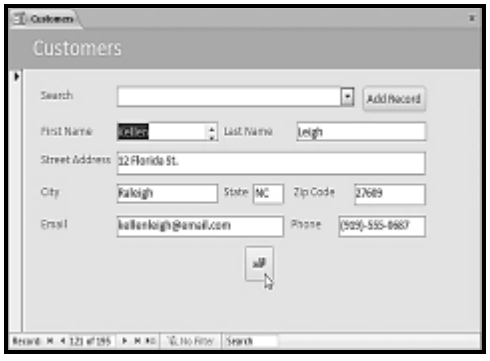
Queries

3.



Relationship

4.



Forms

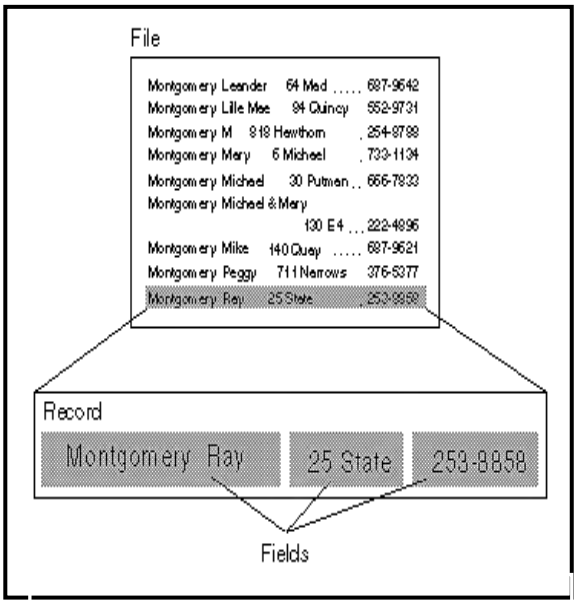
11.5.2 Working with Data

11.5.2.1 Database

A database is a collection of information that is organised so that it can easily be accessed, managed, and updated. In one view, databases can be classified according to types of content: bibliographic, full-text, numeric, and images.

Systematically organised or structured repository of indexed information (usually as a group of linked data files) that allows easy retrieval, updating, analysis, and output of data. Stored usually in a computer, this data could be in the form of graphics, reports, scripts, tables, text, and others, representing almost every kind of information. Most computer applications (including antivirus software, spreadsheets and word-processors) are databases at their core.

In computing, databases are sometimes classified according to their organisational approach. The most prevalent approach is the relational database, a tabular database in which data is defined so that it can be reorganised and accessed in a number of different ways. A distributed database is one that can be dispersed or replicated among different points in a network. An object-oriented programming database is one that is congruent with the data defined in object classes and subclasses.



Traditional databases

Traditional databases are organised by *fields*, *records*, and *files*. A field is a single piece of information; a record is one complete set of fields; and a file is a collection of records. For example, a telephone book is analogous to a file. It contains a list of records, each of which consists of three fields: name, address, and telephone number.

Types and uses of databases

1. **Relational Databases**
   This is the most common of all the different types of databases. The data in a relational database is stored in various data tables. Each table has a key field which is used to connect it to other tables. Hence, all the tables are related to each other through several key fields. These databases are extensively used in various industries and will be the one you are most likely to come across when working in IT.

   Examples of relational databases are Oracle, Sybase and Microsoft SQL Server and they are often key parts of the process of software development. Hence, you should ensure you include any work required on the database as part of your project when creating a project plan and estimating project costs.

2. **Operational Databases**

In its day to day operation, an organisation generates a huge amount of data. Think of things such as inventory management, purchases, transactions and financials. All this data is collected in a database which is often known by several names such as operational/ production database, subject-area database (SADB) or transaction databases. An operational database is usually important to organisation as they include the customer database, personal database and inventory database, the details of how much of a product the company has as well as information on the customers who buy them. The data stored in operational databases can be changed and manipulated depending on what the company requires.

3. **Database Warehouses**

Organisations are required to keep all relevant data for several years. This data is also an important source of information for analysing and comparing the current year data with that of the past years which also makes it easy to determine key trends taking place. All these data from previous years are stored in a database warehouse. Since the data stored has gone through all kinds of screening, editing and integration it does not need any further editing or alteration.

With this database ensure that the Software Requirements Specification (SRS) is formally approved as part of the project quality plan.

4. **Distributed Databases**

Many organisations have several office locations, manufacturing plants, regional offices, branch offices and a head office at different geographic locations. Each of these work groups may have their own database which together will form the main database of the company. This is known as a distributed database.

5. **End-User Databases**

There is a variety of data available at the workstation of all the end users of any organisation. Each workstation is like a small database in itself which includes data in spreadsheet, presentations, word files, note pads and downloaded files. All such small databases form a different type of database called the end-user database.

6. **External Database**

There is a lot of information available in outside world which is required by an organisation. They are privately-owned data for which one can have conditional and limited access for a fortune. This data is meant for commercial usage. All such databases outside the organisation which are of use and limited access are together called external database.

7. **Hypermedia Database**

Most websites have various interconnected multimedia pages which might include text, video clips, audio clips, photographs and graphics. These all need to be stored and

"called" from somewhere when the webpage is created. All of them together form the hypermedia database.
If you are creating such a database from scratch, to be generous when creating a project plan, detailed when defining the Business Requirements Documentation (BRD) in your project cost controls.

8. **Navigational Database**
   Navigational database has all the items which are references from other objects. In this, one has to navigate from one reference to another or one object to another. It might be using modern systems like XPath. One of its applications is the air flight management systems.

9. **In - Memory Database**
   In-memory databases stores data in a computer's main memory instead of using a disk-based storage system. It is faster and more reliable than that in a disk. They find their application in telecommunications network equipment.

10. **Document-Oriented Database**
    A document oriented database is a different type of database which is used in applications which are document oriented. The data is stored in the form of text records instead of being stored in a data table as usually happens.

11. **Real-Time Database**
    A real-time database handles data which constantly keep on changing. An example of this is a stock market database where the value of shares change every minute and need to be updated in the real-time database. This type of database is also used in medical and scientific analysis, banking, accounting, process control, reservation systems etc. Essentially, anything which requires access to fast moving and constantly changing information.

    Assume that this will require a lot more time than a normal relational database when it comes to the software testing life cycle, as these are much more complicated to efficiently test within normal timeframes.

12. **Analytical Database**
    An analytical database is used to store information from different types of databases such as selected operational databases and external databases. Other names given to analytical databases are information databases, management databases or multi-dimensional databases. The data stored in an analytical database is used by the management for analysis purposes, hence the name. The data in an analytical database cannot be changed or manipulated.

Activity 11.5.2.1

Perform the written activity below to test your skills about databases.

A. Name the twelve types of databases.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

B. Define database

_____

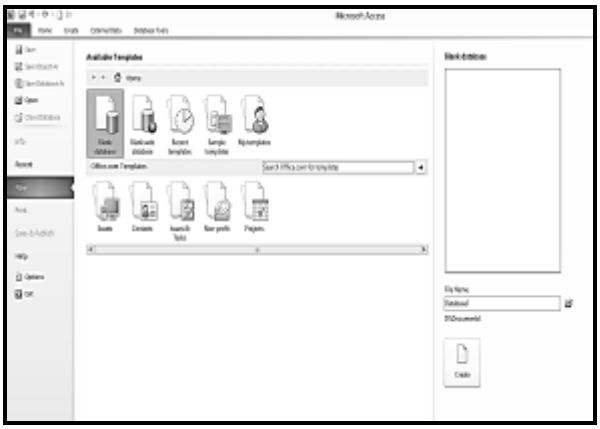
_____

_____

11.5.2.2 Creating Blank Database

Creating New Databases

A new database is a container that will hold all of the tables, form, reports, queries, macros, and modules that you create. In Access 2010, you can create a new database; follow the steps in creating new databases.

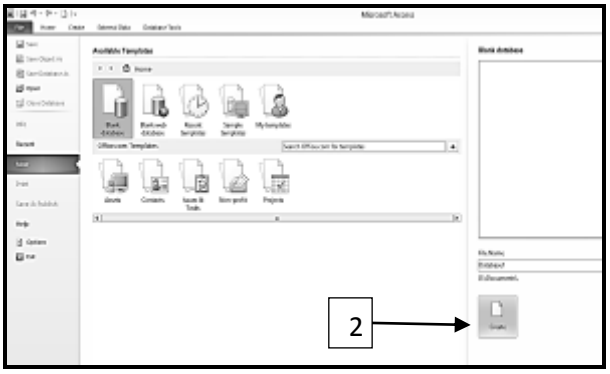


Creating new database

1. Click MS Access in your desktop or Click your Start Button and look for your MS Office 2010, select MS Access 2010.

2. Click the **File** tab in the Ribbon.

3. Then click **New** command.



Getting Started using the blank database

Then select the **Blank database** choice in the **Available Templates** section. In Access 2007, you can create a new blank database by simply clicking the **Blank Database** button In the **New Blank Database** section of the **Getting Started with Microsoft Access** welcome screen. Follow the steps using blank database.

Follow the steps using blank database.

1. In the **Blank Database** pane that appears at the right side of the screen, you can enter a name for the database into the **File Name:** text box.
2. If you want to change the default folder where the database file will be stored, you can click the small folder button at the right end of the **File Name:** text box in order to launch the **File New Database** dialogue box.
3. Use this dialogue box to give the new database file a name and also select where you want to save the file.

New database filename

4. When you are ready, click the **OK** button to close the dialogue box.
5. Then click the **Create** button to create the new database file. Once that is done, the new blank database will appear in the main Access interface.

Activity 11.5.2.2

Perform the following activity to test your ability to write down on how to create a new database.

A. List down the steps on how to create new database. Write your answers on the space provided.

1. _____

_____

2. _____

_____

3. _____

_____

B. Follow the steps below on creating a new database.

1. Open Microsoft Access

2. Type the following data.

Last Name	Given Name	Grade	Class	Student No.
Abe	Michael	9	P	150119
Kila	George	11	G	150123
Henry	Mcray	12	U	150333
Roger	Kenny	9	N	150453
Jones	Hilda	10	P	150111
Dwight	Mary	10	G	150124
Solomon	Solomon	9	U	150234
Mitch	John	9	N	150612
Jonathan	Beatrice	11	P	150101
James	Matthew	12	U	150100

3. Save the new database as Student Profile.

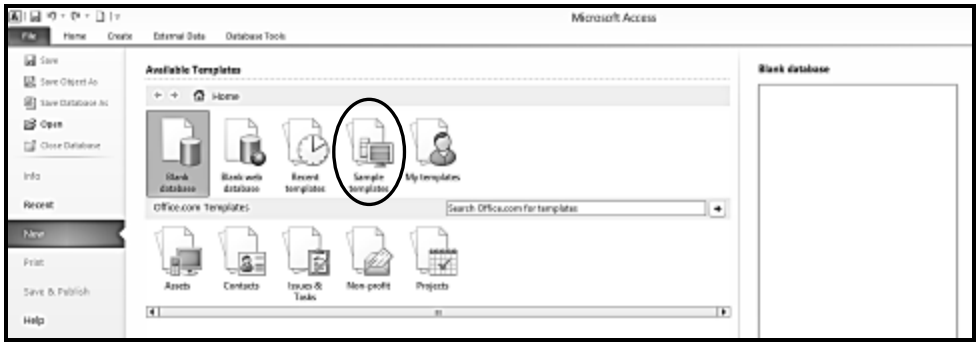
11.5.2.3 Creating a Database from a Template

If you are new to databases, or if you just do not want to spend time creating a database from scratch, Microsoft Access 2010 provides various templates that you can use to quickly create a database that is ready for use. An Access template is a file that, when opened, creates a complete database application. The database is ready to use, and contains all the tables, forms, reports, queries, macros, and relationships that you need to start working. Because the templates are designed to be complete end-to-end database solutions, they save you time and effort and enable you to start using your database right away. After creating a database by using a template, you can customise the database to better suit your needs, just as if you had built the database from scratch.

Create a database by using a template that is included with Access 2010

1. Start Access 2010.

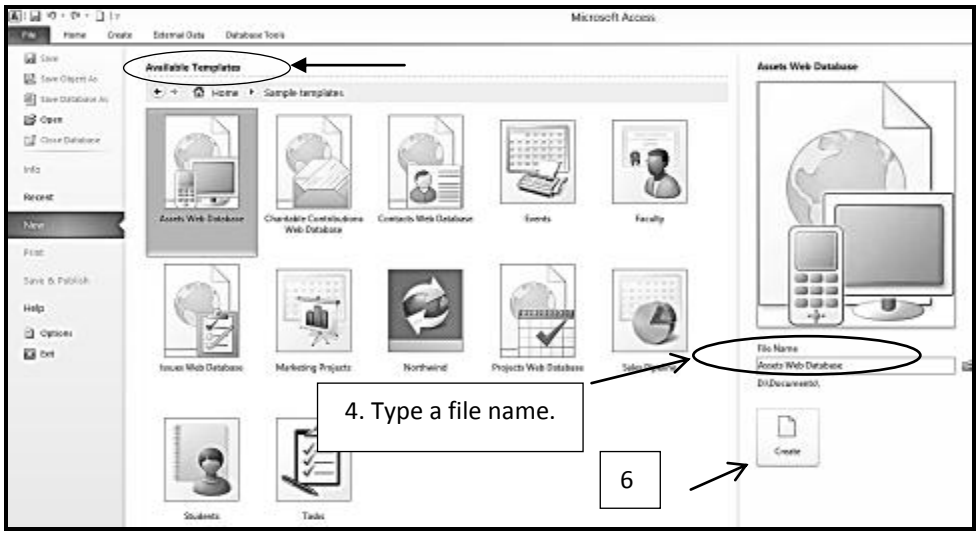
2. On the **New** tab of Microsoft Office Backstage view, click **Sample Templates**.



The Sample Template

3. Under **Available Templates**, click the template that you want to use.

4. In the **File Name** box, type a file name.



Creating new database

5. Optionally, click the folder icon next to the **File Name** box to browse to a location where you want to create the database. If you do not indicate a specific location, Access creates the database in the default location that is displayed below the **File Name** box.

6. Click **Create**. Access creates the database and opens it for use.

Create a database by using a template from Office.com

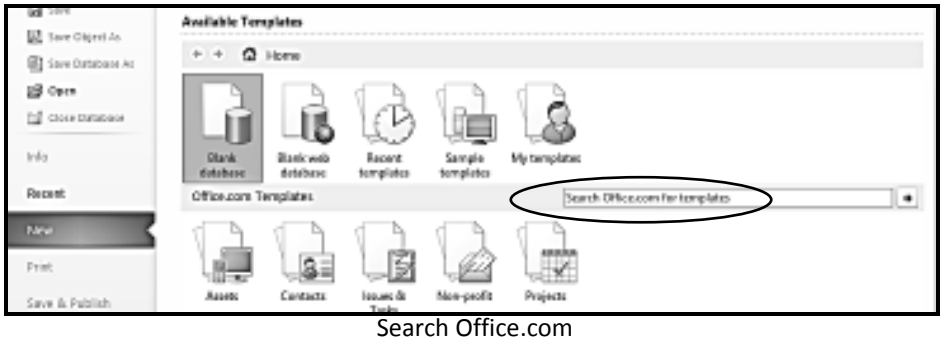
If you are connected to the Internet, you can browse or search for templates on Office.com from within Microsoft Office Backstage view. Use the following procedure:

1. Start **Access 2010.**

2. On the **New** tab of Backstage view, do one of the following:

   a. Browse for a template, under **Office.com Templates** then click the category of template that you are interested in (for example, **Business**).

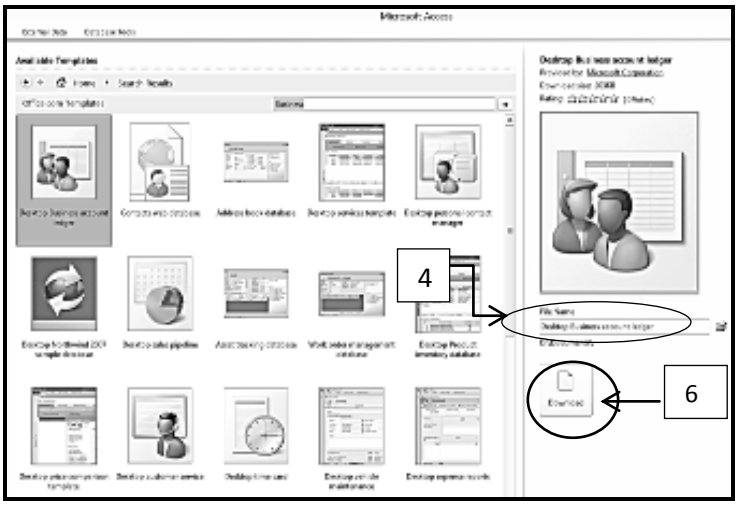
   b. Search for a template in the **Search Office.com** for templates box, type one or more search terms, and then click the arrow button to search.



Search Office.com

3. When you find a template that you want to try, click to select.

4. In the **File Name** box, type a file name.



Available Templates under Business in Office.com

5. Optionally, click the folder icon next to the **File Name** box to browse to a location where you want to create the database. If you do not indicate a specific location, Access creates the database in the default location that is displayed below the **File Name** box.

6. Click **Download**.

Activity 11.5.2.3

Perform the written activity below to test your skills in creating database from a template.

Write the six steps on how to create a database template using Office.com.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

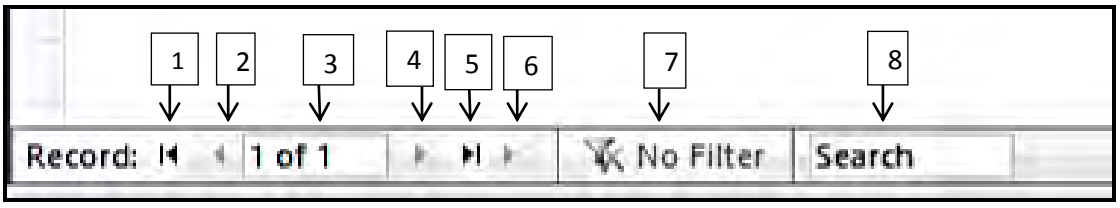
_____

6. _____

_____

11.5.2.4 Managing Data

As your database grows, locating specific records will involve more than a quick glance at a datasheet. In this article, learn five ways to locate specific records based on your needs.
You can browse through records by using the TAB key when you want to move through one record at a time, in order, to locate a specific record. You can also browse through records in a table in Datasheet view using the record navigation buttons. The record navigation buttons are available at the bottom of the table or form.



1. Go to the first record

2. Go to the previous record

3. Current Record box

4. Go to the next record

5. Go to the last record

6. Open a new (blank) record

7. Filter indicator

8. Search box

Note:

1. When you click in the Current Record box, you can type a record number, and then press ENTER to navigate to that record. The record number is counted sequentially from the start of the form or datasheet. It does not correspond to any field value.

2. To know if a filter has been applied, see the filter indicator button. If there is no filter applied or all the filters have been cleared, it displays No Filter. When it displays Filtered, you can click this button to remove the filter. Similarly, when it displays Unfiltered, you can click this button to apply the last filter that you used, if any.

3. When you enter text in the Search box, the first matching value is highlighted in real time as you enter each character. You can use this feature to quickly search for a record with a matching value.

Open the database file "Student Profile".

Last Name	Given Name	Grade	Class	Student No.
Abe	Michael	9	P	150119
Kila	George	11	G	150123
Henry	Mcray	12	U	150333
Roger	Kenny	9	N	150453
Jones	Hilda	10	P	150111
Dwight	Mary	10	G	150124
Solomon	Solomon	9	U	150234
Mitch	John	9	N	150612
Jonathan	Beatrice	11	P	150101
James	Matthew	12	U	150100

To navigate for a specific record

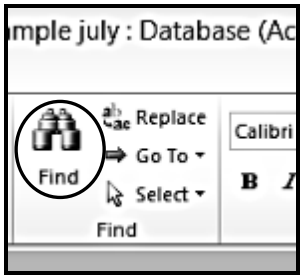
You can search for a specific record in a table or form by using the Find tab in the Find and Replace dialogue box. This is an effective choice for locating a specific record when the record that you want to locate satisfies specific criteria, such as search terms, and comparison operators, such as equals or contains.

You can only use the Find and Replace dialogue box if the table or form currently displays data. This is true even if there are no visible records because a filter has been applied. Follow the steps to navigate for a specific record.

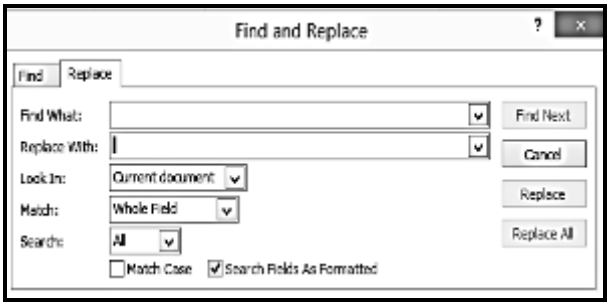
1. Open the database file Student Profile field that you want to search.

2. On the Home tab, in the Find group, click **Find**, or press CTRL+F.

The **Find and Replace** dialogue box appears, with the Find tab selected.

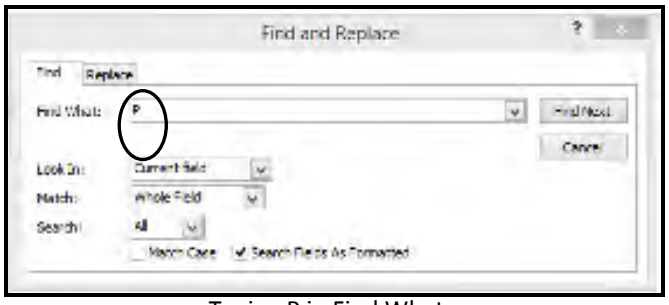


Find Command



Replace Command

3. In the **Find What** box, type P.

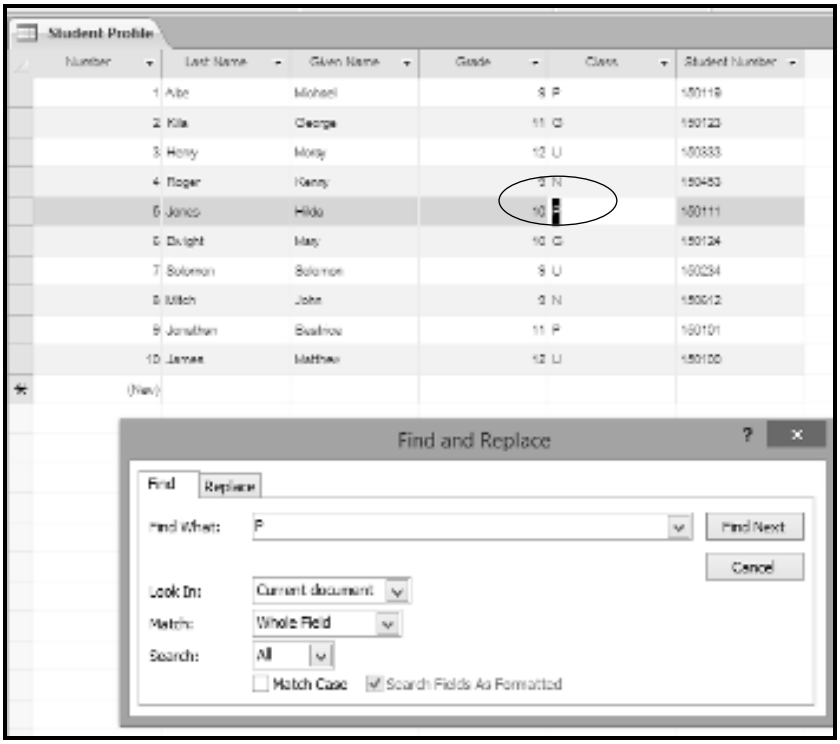


Typing P in Find What

4. To change the field that you want to search or to search the entire underlying table. Click the appropriate option in the Look In list.

   The Match list represents your comparison operator (such as equals or contains). To broaden your search, in the Match list, click Any Part of Field.

5. In the Search list, select All, and then click Find Next. It will display all the records bearing the P class.



6. When the item for which you are searching is highlighted, click **Cancel** in the Find and Replace dialogue box to close the dialogue box. Records that match your conditions are highlighted.

7. Do not close the database file as this will be used in the next topic on adding a new record for table.

Adding records and entering data

Entering data into tables in Access is similar to entering data in Excel. To work with records, you'll have to enter data into cells. If you need help entering data into records, you may want to review our Excel 2010 Cell Basics lesson.

Adding records

To add a new record:

There are three ways to add a new record to a table:

- In the Records group on the Home tab, click the **New** command.

New (blank) record

- On the **Record Navigation bar** at the bottom of the window, click the **New Record** button.

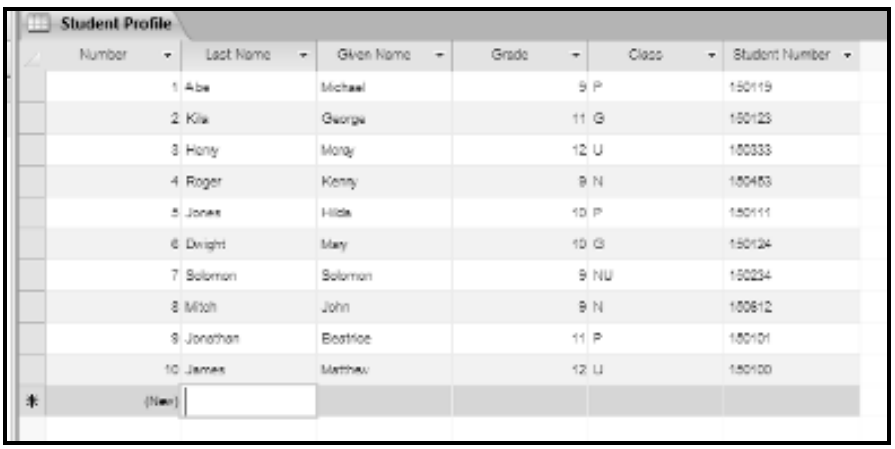
Type the new record

Simply begin **typing** in the row below your last added record.

Occasionally when you enter information into a record, a window will pop up to tell you the information you would have entered is invalid. This means the field you are working with has a validation rule, which is a rule about the type of data that can appear in that field. Click **OK**, then follow the instructions in the pop-up window to re-enter your data.

Using the database file **Student Profile**, follow the steps below on how to add a new record to a table using the Record navigation bar.

1. Select **New** (blank) record button.



2. Try to add records.

3. Keep the file open to continue to the next topic on saving a record.

To save a record

Be sure to save any unsaved records before closing a table. Access will not prompt you to save them when you close the table.

Save a record

1. Using the database file, Student record. Select the **Home** tab, and locate the **Records** group.

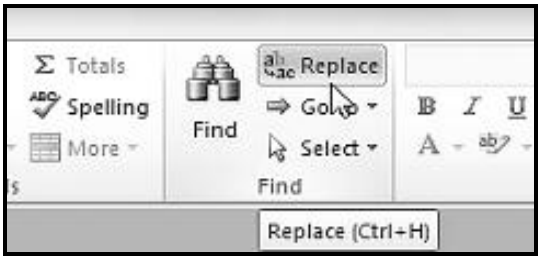
2. Click the **Save** command.

Editing records

To quickly edit any record within a table, simply Click on it and type in your changes. However, Access also offers you the ability to **find and replace** a word within multiple records and to delete records entirely.

To replace a word within a record

You can edit multiple occurrences of the same word by using Find and Replace, which searches for a term and replaces it with another term. Follow the steps to replace a word within a record.



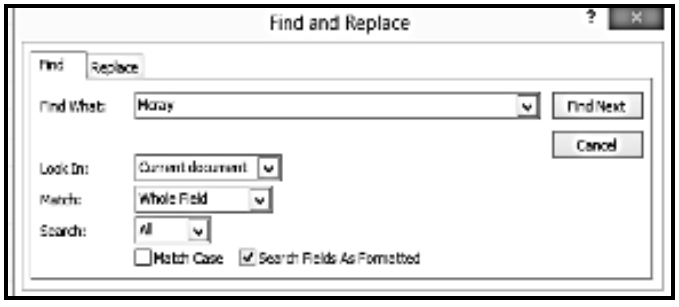
To replace a word

1. Open the Database file “Student Profile”.

2. Select the Home tab, and locate the **Find** group.

3. Select the Replace command. The **Find and Replace** dialogue box will appear.

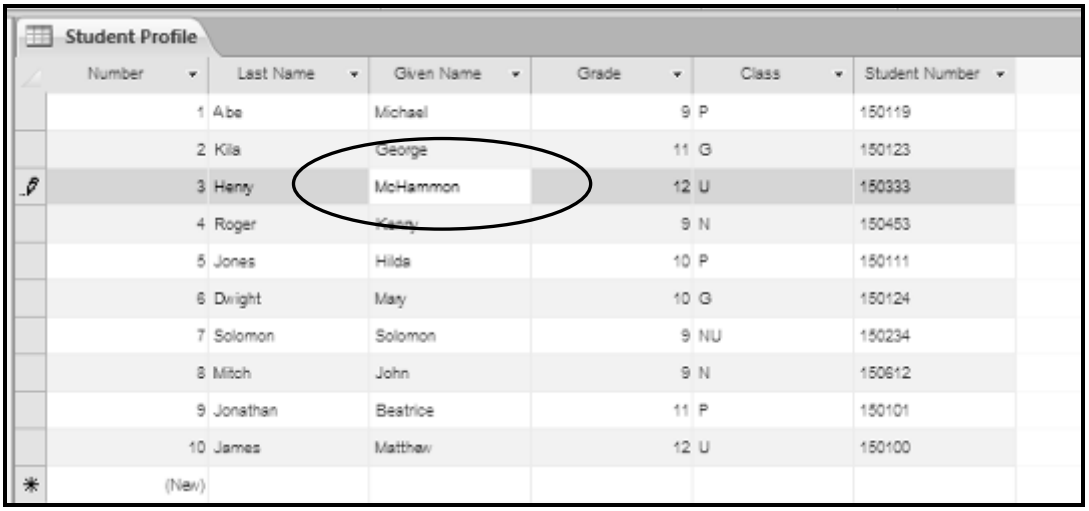
4. Click the **Find What:** box, and type Mcray.



Name Mcray need to replace

5. Click the **Replace With** box, and type McHammon.

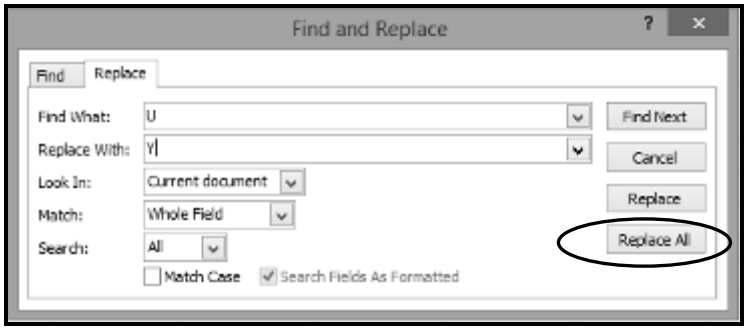
6. Click **Replace.**



The result for the Replace command

Editing records can also be done using the **Replace All** command. Follow the steps below on how to use **the Replace All** command.

1. Find **U**, and use Replace All with **Y.**



To Replace All

2. Select the **Replace All** command.

Student Profile

Number	Last Name	Given Name	Grade	Class	Student Number
1	Abe	Michael	9	P	150119
2	Kila	George	11	G	150123
3	Henry	McHammon	12	Y	150333
4	Roger	Kenny	9	N	150453
5	Jones	Hilda	10	P	150111
6	Dwight	Mary	10	G	150124
7	Solomon	Solomon	9	Y	150234
8	Mitch	John	9	N	150812
9	Jonathan	Beatrice	11	P	150101
10	James	Matthew	12	Y	150100

The result after using the replace All command

Using **Look In,** follow the steps on how to use the Look In command.

The Current document

1. Click the **Look In:** drop-down arrow to select the area you would like to search.
2. Select **Current Field** to limit your search to the currently selected field or;
3. Select **Current Document** to search within the entire table.

Using Match

Follow the steps on how to use Match command.

Any Part of field

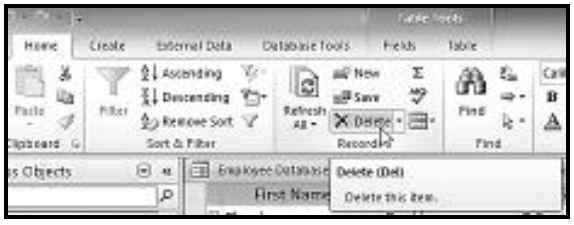
1. Click the **Match:** drop-down arrow to select how closely you would like results to match your search.

Find next

2. Select **Any Part of Field** to search for your search term in any part of a cell or;
3. Select **Whole Field** to search only for cells that match your search term exactly or;
4. Select **Beginning of Field** to search only for cells that start with your search term.

To delete a record:

Deleting record is also possible by following the steps below to delete a record.



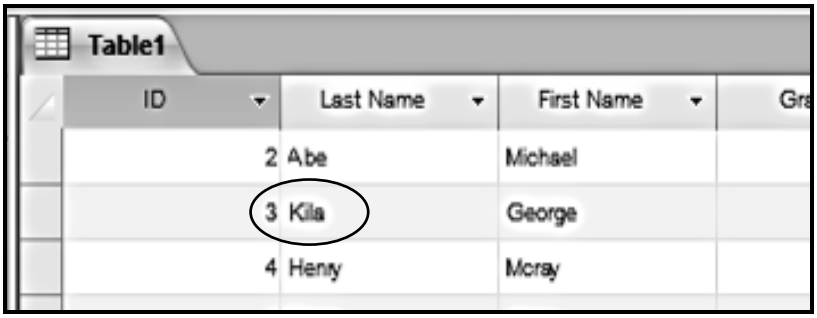
To delete a record

1. Select the entire record by clicking the **gray border** at the left side of the record.
2. Select the **Home** tab, and locate the **Records** group.
3. Click the **Delete** command. The record will be permanently deleted.

Activity 11.5.2.4

Perform the activity below to test your ability on Managing Data, to replace a word within a record.

List down the steps on how to replace a word within a record; using our sample above replace the Last Name from Kila to Kina.



1.

_____

_____

2.

_____

_____

3.

_____

_____

4.

_____

_____

11.5.2.5 Controlling and Searching Records

Essentially, sorting and filtering are tools that let you organise your data. When you sort data, you are putting it in order. Filtering data lets you hide unimportant data and focus only on the data you are interested in.

Sorting records

When you sort records, you are putting them into a logical order, with similar data grouped together. As a result, sorted data is often simpler to read and understand than unsorted data. By default, Access sorts records by their ID numbers. However, there are many other ways records can be sorted. For example, the information in a database belonging to a bakery could be sorted in several ways:

a. Orders could be sorted by **order date** or by the **last name** of the customers who place the orders.

b. Customers could be sorted by name or by the city or zip code where customers live.

c. Products could be sorted by name, category (pies, cakes, cupcakes, etc.), or price.

You can sort both text and numbers in two ways: in ascending order or descending order. Ascending means going up, so an ascending sort will arrange numbers from smallest to largest and text from A to Z. Descending means going down, or largest to smallest for numbers and Z to A for text. The default ID number sort that appears in your tables is an ascending sort, which is why the lowest ID numbers appear first.

	Last Name	First Name
2	Abe	Michael
3	Kila	George
4	Henry	Morey
5	Roger	Kenny
6	Jonas	Hilda
7	Dwight	Mary
8	Solomon	Solomon
9	Mitch	John
10	Jonathan	Beatrice
11	James	Matthew
(New)		

Field

To sort records

Select a field in the cell you wish to sort by. In this example, we will sort by students' last names. Follow the steps to sort records.

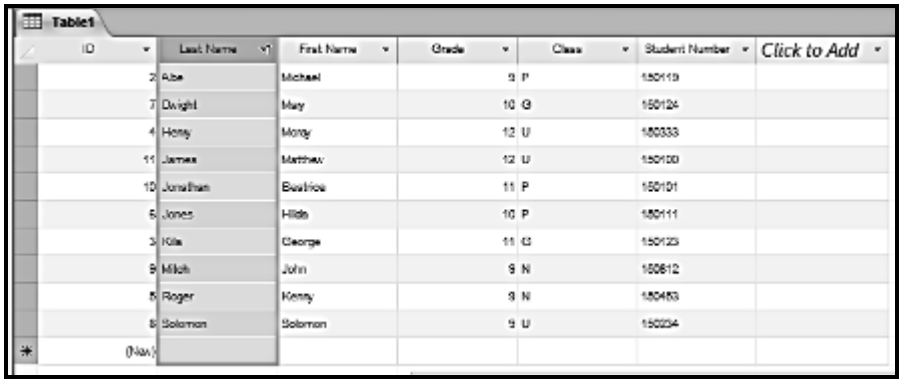
Selecting a field by clicking on its title

1. Click the **Home** tab on the Ribbon, and locate the **Sort & Filter** group.

Ascending or Descending

2. **Sort** the field by selecting the **Ascending** or **Descending** command.

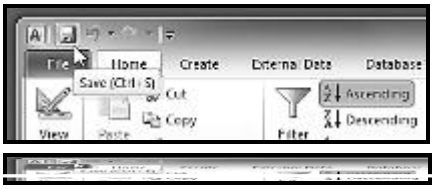
3. Select **Ascending** to sort text A to Z or to sort numbers from smallest to largest. We will select this in our example, since we want the last names to be in A to Z order.



The sorted last names

4. Select **Descending** to sort text Z to A or to sort numbers from largest to smallest.

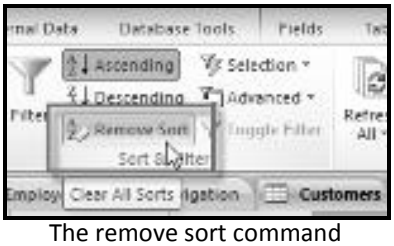
5. The table will now be sorted by the selected field.



Save command on the Quick Access

To **save the new sort**, click the **Save** command on the Quick Access toolbar.

After you save the sort, the records will stay sorted that way until you perform another sort or remove the current one. To remove a sort, simply click the **Remove Sort** command.



The remove sort command

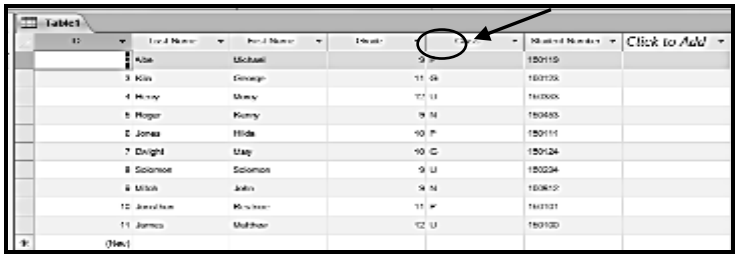
Filtering records

Filters allow you to view **only the data you want to see**. When you create a filter, you set **criteria** for the data you want to display. The filter then **searches** all of the records in the table, **finds** the ones that meet your search criteria, and **temporarily hides** the ones that do not.

Filters are useful because they allow you to **focus in** on specific records without being distracted by the data you are uninterested in. For instance, if you had a database that included customer and order information, you could create a filter to display only customers living within a certain city, or only orders that contain a certain product. Viewing this data with a filter would be far more convenient than searching for it in a large table.

To create a filter

1. Click the drop-down arrow next to the field you would like to filter by.



The drop down arrow

2. We will filter by Grade, as we want to see list of students in their Grades.

Selecting a field to find records

A drop-down menu with a checklist will appear. Only checked items will be included in the filtered results. Use the following options to determine which items will be included in your filter:

To select a field

1. **Select** and **deselect** items one at a time by clicking their check boxes. Here, we will deselect all of the options except for **9**.
2. Click **Select All** to include every item in the filter. Clicking **Select All** a second time will deselect all items.
3. Click **Blank** to set the filter to find only the records with no data in the selected field. Setting the filter to only show records with "9" in the Grade field.
4. Click **OK**. The filter will be applied. Our students table now displays only students who are in Grade 9.

Table1

ID	Last Name	First Name	Grade	Class	Student Number	Click to Add
2	Abe	Michael	9	P	150119	
5	Roger	Kenny	9	N	150453	
8	Solomon	Solomon	9	U	150234	
9	Mitch	John	9	N	150612	

The Grade 9 students after using the **Select All**

Toggling your filter allows you to turn it on and off.

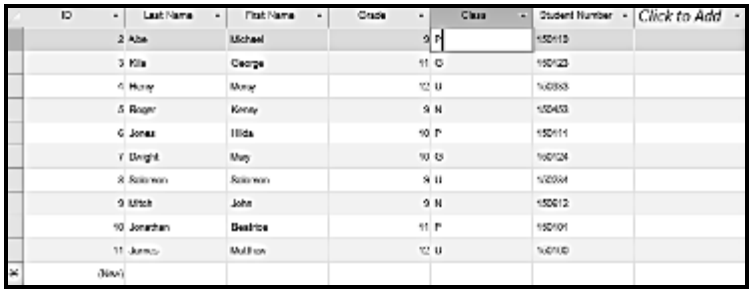
Toggle filter

1. To view records without the filter, simply click the **Toggle Filter** command.
2. To restore the filter, simply click it again.

Creating a filter from a selection

Filtering by selection allows you to **select specific data** from your table and find data that is **similar** or **dissimilar** to it. For instance, if you were working with a student's database and wanted to search for all students whose names belonged to class "P", you could select that word in one class name and create a filter with that selection. Creating a filter with a selection can be more convenient than setting up a simple filter if the field you are working with contains many items. Follow the steps on how to create a filter from a selection.

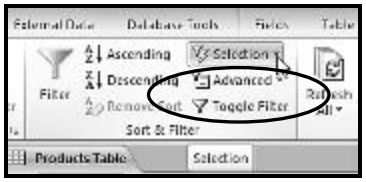
1. Select the cell or data you would like to create a filter with. We want to see a list of all of students that belong to class "P" in their names, so we will select the letter "P" in the **Class** field.



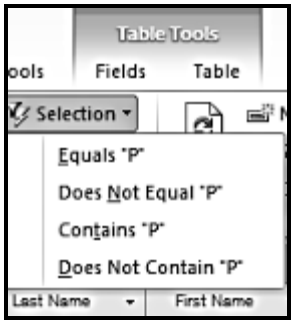
Students in Class P

2. Select the **Home** tab on the Ribbon, and locate the **Sort & Filter** group.

3. Click the **Selection** drop-down arrow.



Selection

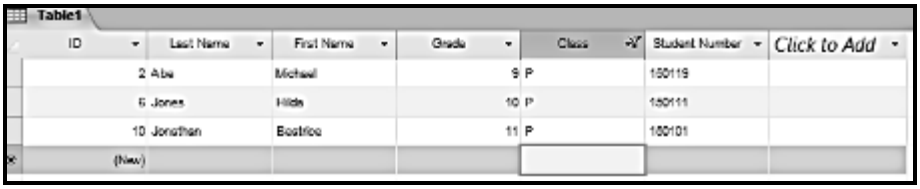


The Selection type

4. Select the type of filter you would like to set up

- **Equals**, which includes only records with data that is identical to the selected data
- **Does Not Equal**, which includes all records except the data that is identical to the selection
- **Begins With**, which includes only records whose data for the selected field **begins** with the search term
- **Does Not Begin With**, which includes all records **except** those whose data for the selected field begins with the search term

5. Setting the filter to show only records that contain the selected word. The filter will be applied. Our table now displays only students with the letter "P" in their names.



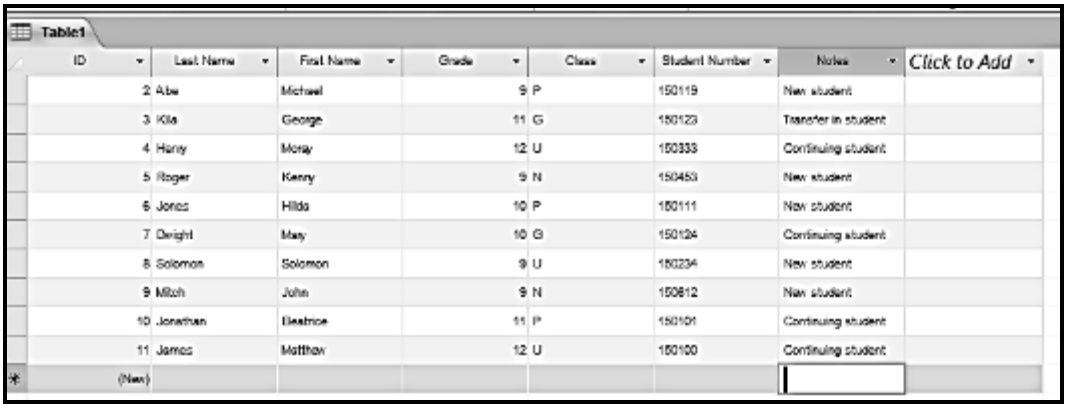
The result after selecting Class P

Filtering records by criteria

You can also create a filter by entering a **search term** and specifying the way Access should match data to that term. Creating a filter from a criterion is similar to creating a filter from a selection.

To filter text by a criteria

Click the **drop-down arrow** next to the field you would like to filter by. We want to filter the records in our orders table to display only those that contain notes with certain information, so we will click the arrow in the **Notes** field.



Selecting a field to filter by

In the drop-down menu, hover your mice over the words **Text Filters**. From the list that appears, select the way you would like the filter to match the term you enter. In this example, we want to view only records whose notes indicate the order which was placed for a party. We will select **Contains** so we can search for records that contain the word "New". Follow the steps in selecting filter setting.

1. The **Custom Filter** dialogue box will appear. Type in the word you would like to use in your filter. Typing the term the filter will search for.

2. Click **OK**. The filter will be applied.

Custom Filter

Text Filters

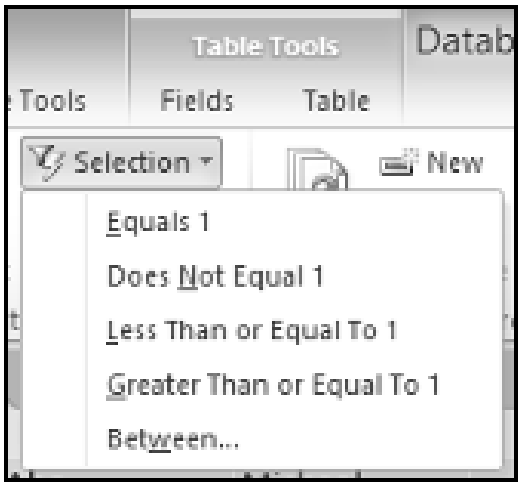
Table1

ID	Last Name	First Name	Grade	Class	Student Number	Notes	Click to Add
2	Abe	Michael	9	P	150119	New student	
5	Roger	Kenny	9	N	150453	New student	
6	Jones	Hilda	10	P	150111	New student	
8	Solomon	Solomon	9	U	150234	New student	
9	Mitch	John	9	N	150512	New student	

Filtering numbers by criteria

The process for filtering numbers by criteria is similar to the process for filtering text. However, different filtering options are available to you when working with numbers. In addition to the **Equals** and **Does not Equal**, you can choose:

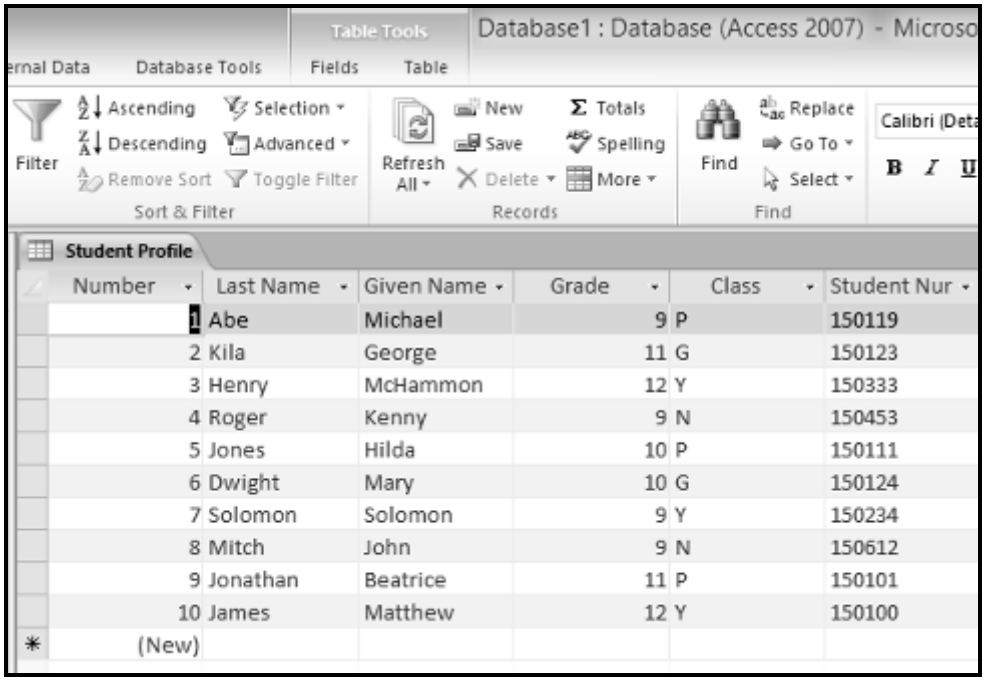
- **Greater Than** to include only records with numbers in that field **greater than or equal to** the number you enter
- **Less Than** to include only records with numbers in that field **less than or equal to** the number you enter
- **Between** to include records with numbers that falls within a certain range.



The Filter Selection

Follow the steps below on how to filter numbers by criteria.

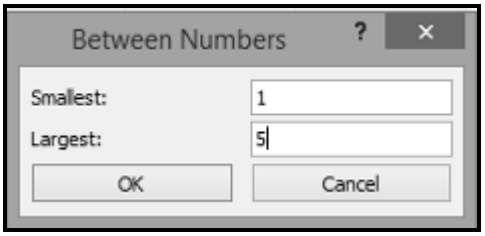
1. Open your database **Students Profile.**



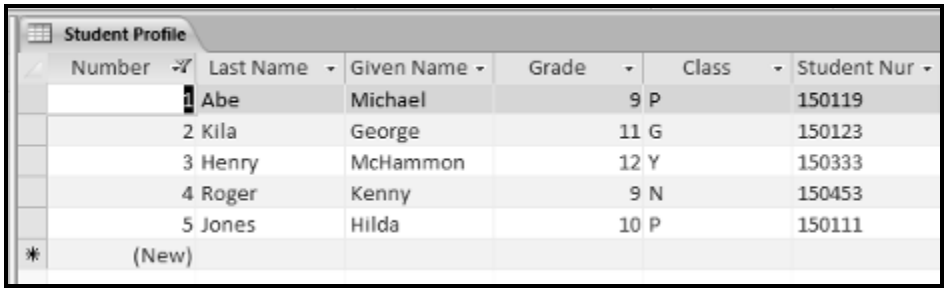
Number	Last Name	Given Name	Grade	Class	Student Nur
1	Abe	Michael	9	P	150119
2	Kila	George	11	G	150123
3	Henry	McHammon	12	Y	150333
4	Roger	Kenny	9	N	150453
5	Jones	Hilda	10	P	150111
6	Dwight	Mary	10	G	150124
7	Solomon	Solomon	9	Y	150234
8	Mitch	John	9	N	150612
9	Jonathan	Beatrice	11	P	150101
10	James	Matthew	12	Y	150100
*	(New)				

2. Filter the numbers by criteria using **Between.**

3. Choose Student Numbers from 1 to 5.



4. Click **OK**.



Number	Last Name	Given Name	Grade	Class	Student Nur
1	Abe	Michael	9	P	150119
2	Kila	George	11	G	150123
3	Henry	McHammon	12	Y	150333
4	Roger	Kenny	9	N	150453
5	Jones	Hilda	10	P	150111
*	(New)				

The result after using Between Numbers in Filtering.

Activity 11.5.2.5

Using the database file **Student Profile,** Filter numbers by criteria. Select students in Students Numbers Field with less than **15025**. List down the results.

1._____

2._____

3._____

4._____

11.5.2.6 Opening, Closing and Saving a Database

Before you open Access

Before creating your database you have to decide what data you have to put into the database to get the results you want, you need to determine how you will organise the data. When you are storing people's names it is easier to manage these if you split these into first name and last name. If you do this you can search for a person by last name and create lists in alphabetical order. You can also use the mail merge option to send letters which read "Dear Mary," or more. If you do not split people's names into first name and last name, then these tasks will be more difficult to complete or you will end up with letters which read "Dear Mary Brown" or you will have James Smith appearing before Xavier Brown in an alphabetical listing!

If you are entering addresses, split these into Street Address, Town, Country and Zip code so that you can use this information to create mailing labels and mail merge letters. If you split this information into multiple parts you will be able, for example, to get a list of everyone who lives in Bath or in France.

Each individual piece of data, for example; last name, zip code, town, becomes one field (or column) in your database table. You need to give each field a name and to specify the type of data you are storing in each field - whether it is text, date, number, Boolean (yes/no), or more. This is an important step that affects the way you get information out of your database later on and how you search it.

In Access, you will also need a Primary Key which is a field (or a combination of fields) which are unique to each record. In our case, we could not use the last name as our Primary Key because there are some people with the same last name (so it is not unique) but we could use a combination of first name and last name as that is unique for this data. If you do not have a field or combination of fields which are unique, you can add a counter field to your table which will allocate each entry a unique number – then you can set this as your primary key field.

Our database is a simple two dimensional table but Access is capable of much more complex structures. For example you can have a database containing multiple tables which are related to each other. In our example, we could add a table with the player's statistics for each year they have been playing for the club and we could link this to the player table. When you create a database containing more than one table of data you must determine how your tables relate to each other and how they will be linked so that you can get information from more than one table. In our scenario there is only one table so we will bypass this step for now.

At the end of the planning stage you should have a list of field names and data types something like this:

Field name	Type
First Name	text
Last Name	text

Grade	text
Fees Paid	yes/no
Years A Member	number
Birthdate	date/time

Opening MS Access

When you start Access 2010, you see the Microsoft Office Backstage view, where you can get information about the current database, create a new database, open an existing database, and view featured content from Office.com.

The MS Access 2010 start view

Backstage view also contains many other commands that you can use to adjust, maintain, or share your databases. Commands in Backstage view generally apply to entire databases, not to objects inside of a database. You can get to Backstage view at any time by clicking the **File** tab.

Open an existing Access database

To quickly open one of the last several databases that you had open, on the **File** tab, Click **Recent**, and then click the file name. Follow the steps on how to open an existing Access database.

The File tab

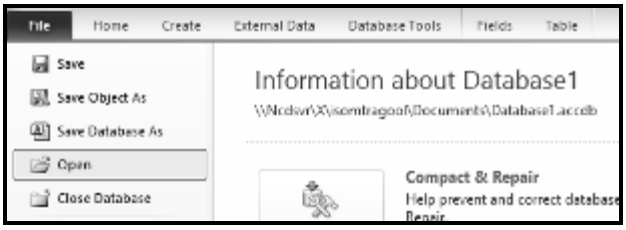
1. On the **File** tab, click **Open**.

2. Click a shortcut in the **Open** dialogue box — or, in the **Look in** box; Click the drive or folder that contains the database that you want.

3. In the folder list, double-click folders until you open the folder that contains the database.

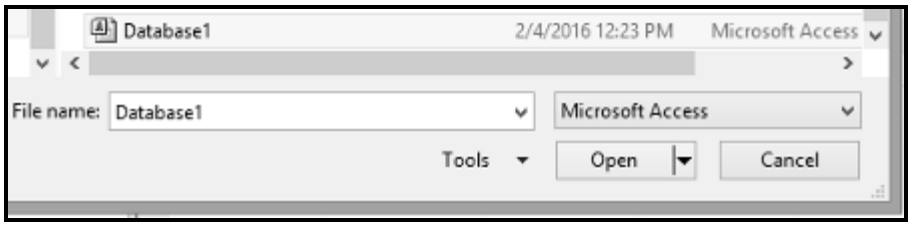
You can do the following in opening and existing Access database.

- To open the database in default open mode, double-click it.



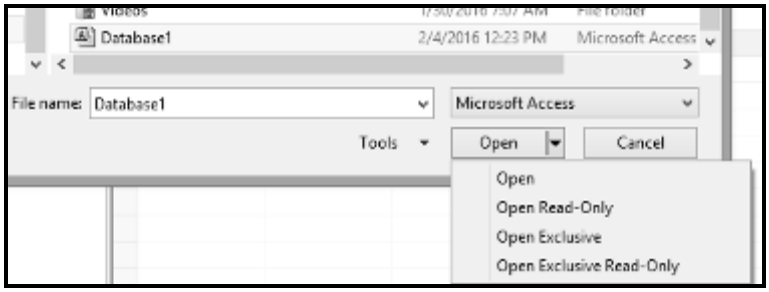
The open mode in Access

- To open the database for shared access in a multiuser environment, so that both you and other users can both read and write to the database at the same time, click **Open**.



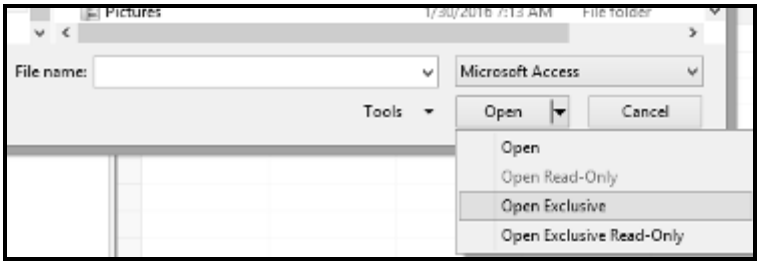
To name the Access database

- To open the database for read-only access, so that you can view it but cannot edit it, click the arrow next to the **Open** button, and then click **Open Read-Only**.



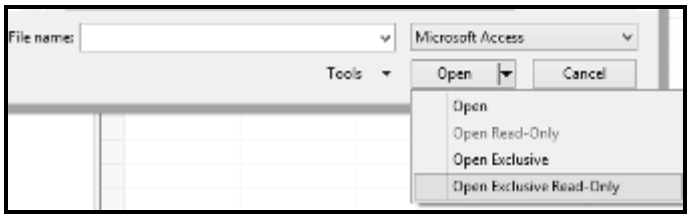
The open mode in Access

- To open the database for exclusive access, so that no one else can open it while you have it open, click the arrow next to the **Open** button, and then click **Open Exclusive**.



The Open Exclusive

- To open the database for read-only access, click the arrow next to the **Open** button, and then click **Open Exclusive Read-Only** Other users can still open the database, but they only have read-only access.



The Open Exclusive Read-Only

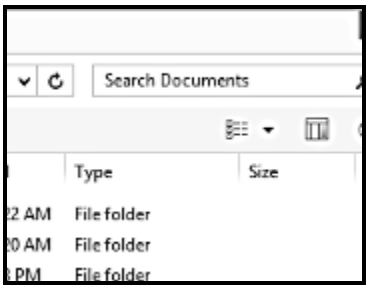
Follow Using Search Documents instructions on how to use Search Document.

1. In the Open dialogue box, click the My Computer shortcut — or, in the Look in box, click My Computer.

2. In the list of drives, right-click the drive that you think might contain the database, and then click Search.

3. Enter your search criteria, and then press **ENTER** to search for the database.

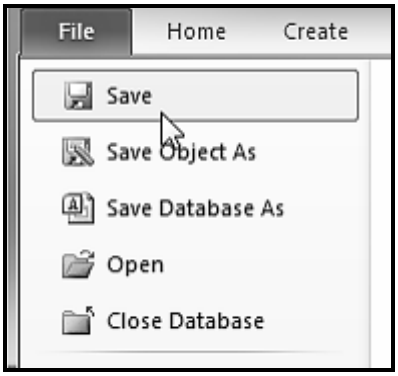
4. If the database is found, open it by double-clicking it in the Search Results dialogue box. Because the search was initiated from the **Open** dialogue box, you must click **Cancel** in that dialogue box before the database will open.



To search the documents

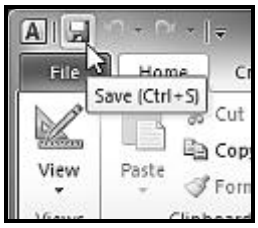
To save an object

Objects like tables, forms, and reports are saved in Microsoft Access.



To save an objects

As in other Microsoft Office programs, you will be prompted to save any unsaved work when you attempt to close your database. However, it is a good idea to save your work as you go along. Saving your work often is the best way to ensure you do not lose any information if your computer crashes. Follow the steps below on how to save objects.



To Save file

1. Select the object you wish to save by clicking its tab in the **Document Tabs bar**.

2. Select the **File** tab to navigate to **Backstage View**.

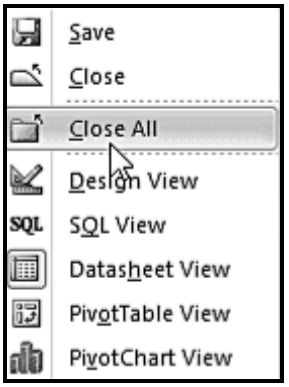
3. Click **Save**.

4. The first time you save an object, you will be prompted to name it. Enter the desired object name, and then click **OK**.

To save an existing object, select **save** in **Backstage View**, or simply click the **Save** command in the Quick Access toolbar.

To close an object

You can also close an object by right-clicking its tab on the Document Tabs bar. A drop-down menu will appear. Select **Close** to close that object, or **Close All** to close all open objects. You can also follow the instructions below on how to close an object.



The Close All

1. Select the object you wish to close on the **Document Tabs bar**.
2. Click the  on the far right of the Document Tabs bar.
3. If there are any unsaved changes to the object, you will be prompted to save it. Select **Yes** to save, **No** to close it without saving your changes, or **Cancel** to leave the object open.

To rename an object

You can also rename an object by following the given steps.

To rename an object

1. If the object you wish to rename is open, **close** it.
2. In the **Navigation Pane**, **right-click** the object you would like to rename.
3. Select **Rename**.

Activity 11.5.2.6

Perform the activity below to test your skill in Closing and Saving a database.

Write the steps on how to open an existing Access database.

1._____

2._____

3._____

Summative Activities 11.5.2

1. Define traditional database

_____

_____

_____

_____

2. Create a New blank database, and name it as “Sample1”. Write your steps on how to create a new blank database.

2.1_____

_____

2.2_____

_____

2.3_____

_____

3. Sort the Students on their Last Name field by selecting the Descending command.

4. Create a Filter for the Grade 12 students.

5. Select Grade 10 Class G students.

Answers to Learning Activities 11.5.2

Activity 11.5.2.1

A.

1. Relational Databases
2. Operational Databases
3. Database Warehouses
4. Distributed Databases
5. End-User Databases
6. External Database
7. Hypermedia Database
8. Navigational Database
9. In-Memory Database
10. Document-Oriented Database
11. Real-Time Database
12. Analytical Database

B.

Database - is a collection of information that is organised so that it can easily be accessed, managed, and updated. In one view, databases can be classified according to types of content: bibliographic, full-text, numeric, and images.

Activity 11.5.2.2

A.

1. Click MS Access in your desktop or Click your Start Button and look for your MS Office 2010, select MS Access 2010.

2. Click the File tab in the Ribbon.

3. Then click New command.

B.

Student Profile

Number	Last Name	Given Name	Grade	Class	Student Nur
1	Abe	Michael	9	P	150119
2	Kila	George	11	G	150123
3	Henry	McHammon	12	U	150333
4	Roger	Kenny	9	N	150453
5	Jones	Hilda	10	P	150111
6	Dwight	Mary	10	G	150124
7	Solomon	Solomon	9	U	150234
8	Mitch	John	9	N	150612
9	Jonathan	Beatrice	11	P	150101
10	James	Matthew	12	U	150100
(New)					

Activity 11.5.2.3

1. Start Access 2010.

2. On the New tab of Backstage view, do one of the following:

   a. Browse for a template, under Office.com Templates, Click the category of template that you are interested in (for example, Business).

   b. Search for a template In the Search Office.com for templates box, type one or more search terms, and then click the arrow button to search.

3. When you find a template that you want to try, Click to select.

4. In the File Name box, type a file name.

5. Optionally, click the folder icon next to the File Name box to browse to a location where you want to create the database. If you do not indicate a specific location, Access creates the database in the default location that is displayed below the File Name box.

6. Click Download.

Activity 11.5.2.4

1. Select the Home tab, and locate the Find group.

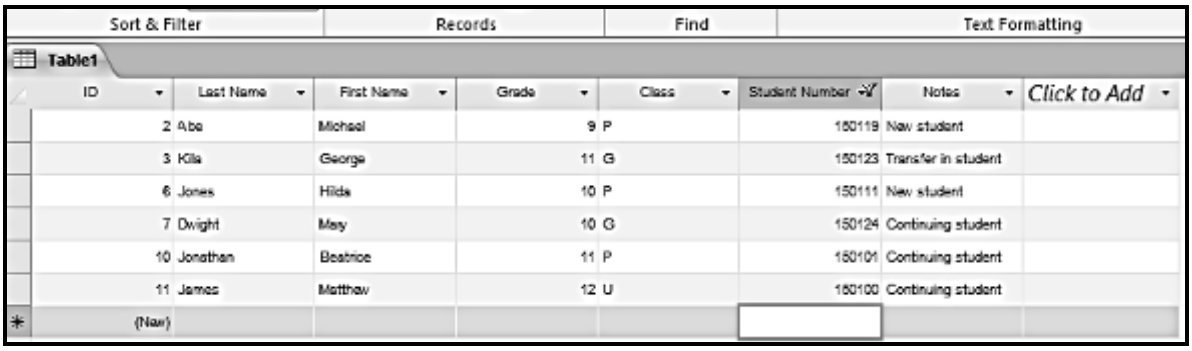
2. Select the Replace command. The Find and Replace dialogue box will appear.

3. Click the **Find What:** box, and type Kila.

4. Click the **Replace With**: box, and type Kina to replace the original word.

Activity 11.5.2.5

The following Students should appear in your result. Perform the following steps below if you have a different result.



To filter numbers by a criteria

1. Click the drop-down arrow next to the field you would like to filter by. We want to filter the records in our table by student number, so we will click the arrow in the Student Number field.

2. In the drop-down menu, hover your mice over the words Number Filters. From the list that appears, select the way you would like the filter to match your search term. Select Less Than.

3. The Custom Filter dialogue box will appear. Type in the number or numbers you would like to use in your filter. We will type "150125" so the filter will show us only menu items that will be equal to or less than 150125.

4. Click OK. The filter will be applied.

Activity 11.5.2.6

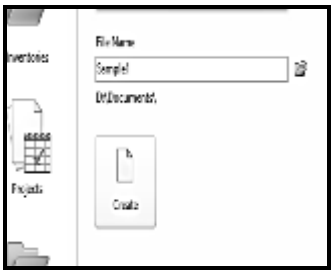
1. On the File tab, Click **Open**.

2. Click a shortcut in the Open dialogue box — or, in the **Look in** box; click the drive or folder that contains the database that you want.

3. In the folder list, double-click folders until you open the folder that contains the database.

Answers for Summative Activity 11.5.2

1. Traditional database



Traditional databases are organised by *fields*, *records*, and *files*. A field is a single piece of information; a record is one complete set of fields; and a file is a collection of records. For example, a telephone book is analogous to a file. It contains a list of records, each of which consists of three fields: name, address, and telephone number.

2. Creating a new blank database with a filename “Sample1”.

2.1 Open MS Access 2010.

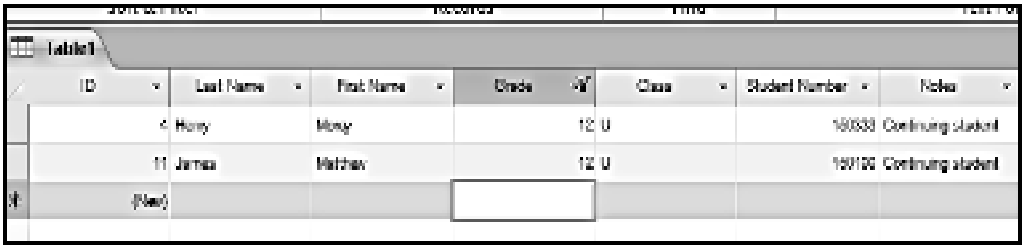
2.2 Type “Sample1” in File Name box.

2.3 Click New or select Enter key.

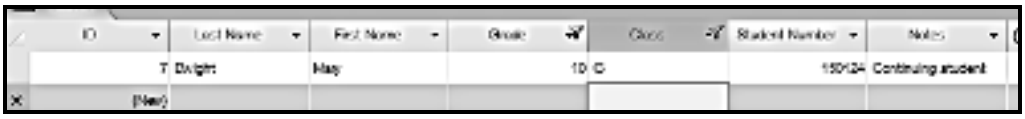
3. Sorting the Last Name field in Descending order.

ID	Last Name	First Name	Grade
8	Solomon	Solomon	9
5	Roger	Kenny	9
9	Mitch	John	9
3	Kila	George	11
6	Jones	Hilda	10
10	Jonathan	Bestrice	11
11	James	Matthew	12
4	Henry	Moray	12
7	Dwight	Mary	10
2	Abe	Michael	9
(New)			

4. Creating a Filter for the Grade 12 students.



5. To select Grade 10 students in Class G.



11.5.3 Working with Tables and Relationships

11.5.3.1 Creating Tables in Table Design and Data Sheet View

Tables are the main units of data storage in Access. Recall that a table is made up of one or more **columns** (or fields) and that a given column may appear in more than one table in order to indicate a relationship between the tables.

Two tables would be sufficient to store the data about **Students** and their bank **Information**. We now give the step-by-step instructions for creating these two tables in Access.

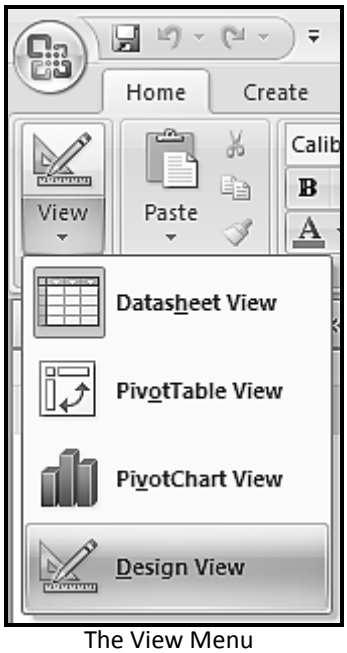
There are a number of ways to create a table in Access. Access provides *wizards* that guide the user through creating a table by suggesting names for tables and columns. The other main way to create a table is by using the **Design View** to manually define the columns (fields) and their data types.

While using the wizards is a fast way to create tables, the user has less control over the column names (fields) and data types. In this tutorial, we will describe the steps to create a table using the **Design View**. Students are encouraged to experiment on their own with using the Create Table wizard.

Creating a Table Using the Design View
To create a table in Access using the Design View, perform the following steps:

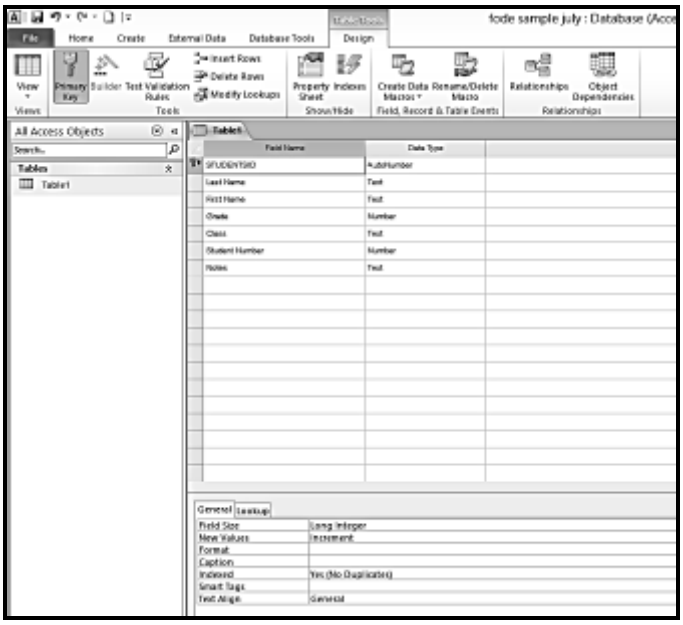
1. In Access 2007, 2010 and 2013, the Create New Table tab should already be highlighted and a new table named table1 created.

   If this is not the case, Click on the **Create** tab and Click on the **Table** icon. Then pull down the *View* menu and choose **Design View**.



The View Menu

2. The Table Design View will appear. Fill in the **Field Name**, **Data Type** and **Description** for each column/field in the table. The STUDENTID field is filled in below:

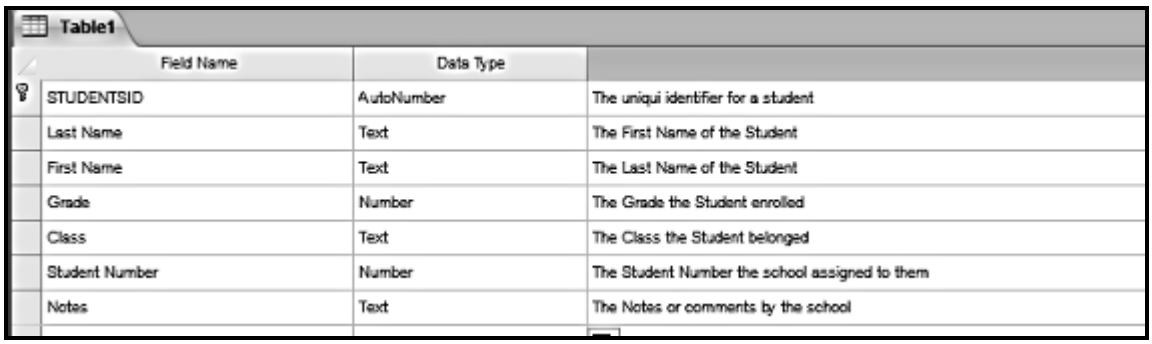


3. Note that the default name given for the table is **Table1**. In a later step, we will assign an appropriate name for this table.

4. Fill in the information for the fields as follows:

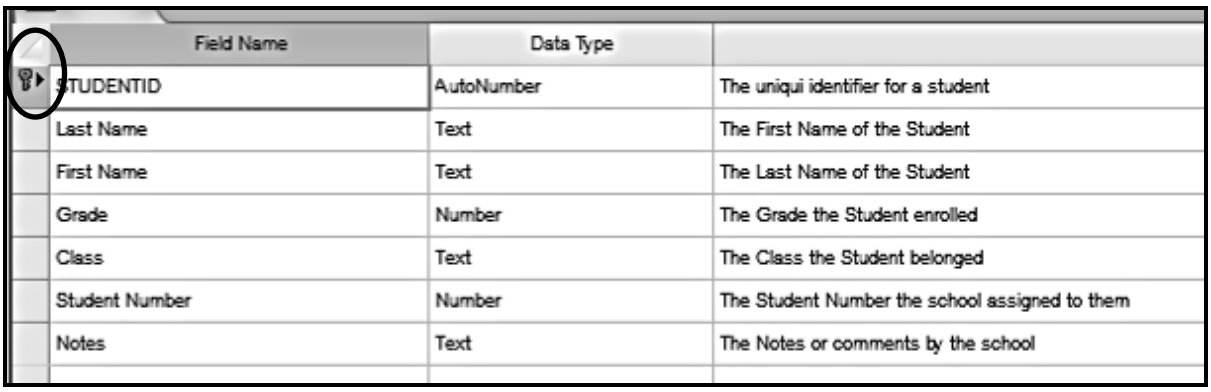
Field Name	Data Type	Description
STUDENTID	Number	The Unique Identifier for a Student
FirstName	Text	The First Name of the Student
LastName	Text	The Last Name of the Student
Grade	Number	The Grade the Student enrolled
Class	Text	The Class the Student belonged
Student Number	Number	The Student Number the school assigned to them
Notes	Text	The Notes or comments by the school

5. A figure showing the design view with the new table definition filled in is given below:



6. The next step is to define the Key for the table and to save the table.

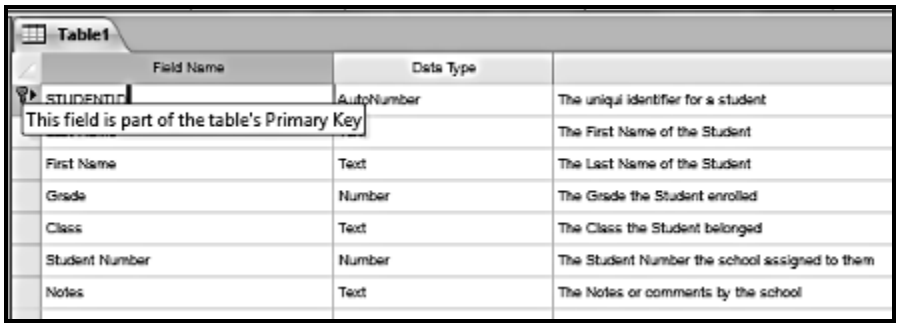
7. Now that all of the fields have been defined for the table, a Primary Key should be defined. Recall that the Primary Key will be used to uniquely identify a record in the table (in this case a Customer). Highlight the **STUDENTID** field and Click on the Primary Key button on the button bar.



Field Name	Data Type	
STUDENTID	AutoNumber	The uniqui identifier for a student
Last Name	Text	The First Name of the Student
First Name	Text	The Last Name of the Student
Grade	Number	The Grade the Student enrolled
Class	Text	The Class the Student belonged
Student Number	Number	The Student Number the school assigned to them
Notes	Text	The Notes or comments by the school

8. Notice that a small key appears next to the field name on the left side.

To remove a primary key, simply repeat this procedure to toggle the primary key off.



As a final step, the table must be saved
Follow the steps below on how to save the table.

1. Pull down the Office menu and choose the **Save As** menu item.

2. A dialogue box will appear where the name of the new table should be specified.

3. Remember, that Access gives a default name such as **Table1** or **Table2**. Simply typeover this default name with the name of the table.

4. For our example, name the table: **Student.**

5. Then Click on the **OK** button.

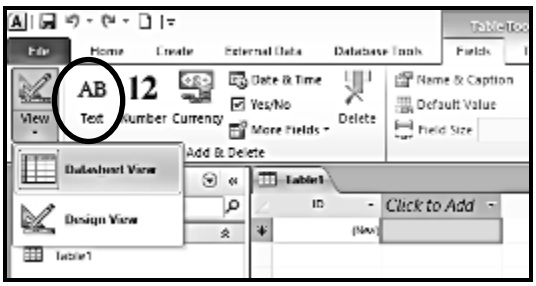
Note: The data types which include text number and others are discussed in detail on pages 80 – 81

Creating Data Sheet View

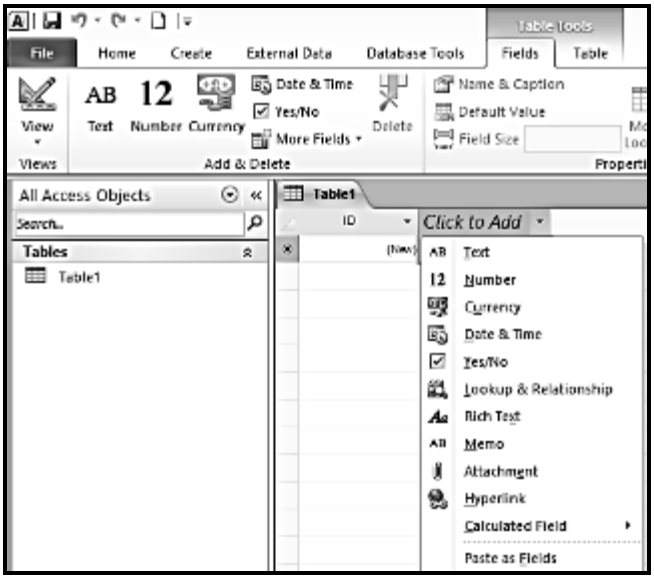
When you create a field by entering data in Datasheet view, Access examines that data to determine the appropriate data type for the field. For example, if you enter **1/1/2006**, Access recognizes that data as a date and sets the data type for the field to Date/Time. If Access cannot definitively determine the data type, the data type is set to Text by default.

The data type of the field determines which other field properties you can set. For example, you can set only the **Append Only** property for a field that has the Hyperlink data type or the Memo data type. There may be cases where you want to manually change a field's data type. For example, suppose you have numbers that resemble dates, such as 05/2015. If you enter **05/2015** into a new field in Datasheet view, the automatic data type detection feature selects the Date/Time data type for the field. Because numbers are labels, and not dates, they should use the Text data type. Use the following procedure to change a field's data type.

1. On the Ribbon, click the **Datasheet** View tab.



2. Click drop down arrow for the Data Type list; select the data type that you want.



3. For your practice click Table, to create your new Table.

4. Use your mouse to **Click to Add**, assign TEXT as your Data Type for this first Field.

5. Type the Field **Last Name,** click again the **Click to Add** to type the other Fields.

6. Assign Data Type for every Fields.

Data	Data Type
First Name	TEXT
GRADE	NUMBER
CLASS	TEXT
STUDENT NUMBER	NUMBER
NOTES	TEXT

The result after typing all the Fields in a Datasheet View.

Activity 11.5.3.1

Perform the practice activity below to test your ability to create table using the views in Access.

A. Create a table in the Datasheet View using the following data.

1. Open your MS Access, type the following data and assign the Data Types for each Fields.

Data	Data Type
Customer Last Name	TEXT
Given Name	TEXT
Age	NUMBER
Date Applied	DATE/TIME
New Member	YES/NO

2. Save this Practice **Student2.**

B. Create a Design View from the given Practice Activity A.

1. Change Field 1 from Customer Last Name to Last Name.

2. Save your work **Student3.**

11.5.3.2 Adding, Deleting, and Moving Fields

Fields are elements in a table. They are formed from different data types, such as text or numbers. A field may be designated as a primary key, where it has a unique value for each record, is indexed, and identifies a record. An ID field is normally designated as a primary key, and it is usually placed into a second table in order to create a relationship between them. An ID field that is placed inside of a second table is called a foreign key.

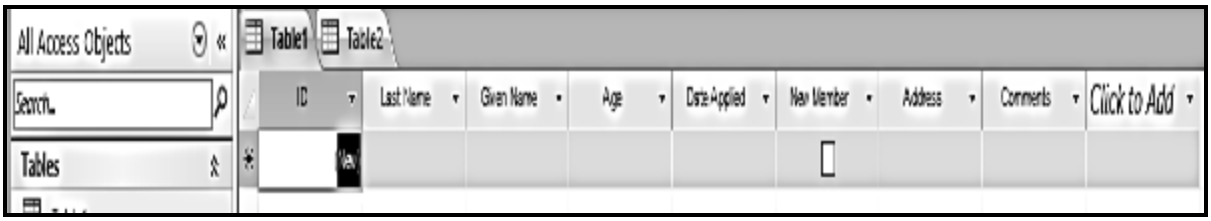
When you add a field by entering data in Datasheet view, Access automatically assigns a generic name to the field. Access assigns the name Field1 to the first new field, Field2 to the second new field, and so on. By default, a field's name is used as its label wherever the field is displayed, such as a column heading on a datasheet. Renaming fields so that they have more descriptive names helps make them easier to use when you view or edit records.

Before you create fields, try to separate data into its smallest useful parts. It is much easier to combine data later than it is to pull it apart. For example, instead of a Full Name field, consider creating separate fields for Last Name and First Name. Then, you can easily search or sort by First Name, Last Name, or both. If you plan to report, sort, search, or calculate on an item of data, put that item in a field by itself.

A. Adding Fields in Design View

Design view provides greater flexibility than Datasheet view because you can set all available data types, and you can create a lookup field, all without having to leave Design view. Access now infers most data types when you first enter data in a new column. If you enter a name in the first field in your new table, Access sets that field to the Text data type. If you paste a date, Access sets the field to the Date/Time data type, and so on. If you paste a mix of data, such as postal codes from several countries/regions, Access selects the data type that does the best job of preserving the information — usually, the Text data type. Follow steps in Adding Fields in Datasheet View.

1. Use our **Student2** to add Fields.
2. Click **Design View** on the shortcut menu or on the Access status bar, click **Design View**.
3. Enter data type in the **Click to Add** column, Click the drop down arrow for the Data type.
4. Choose TEXT for the Data Type.
5. Type **Address** in the new Field.
6. Go to step 1, and choose MEMO for the Data Type.
7. Type **Comments** in the new Field.

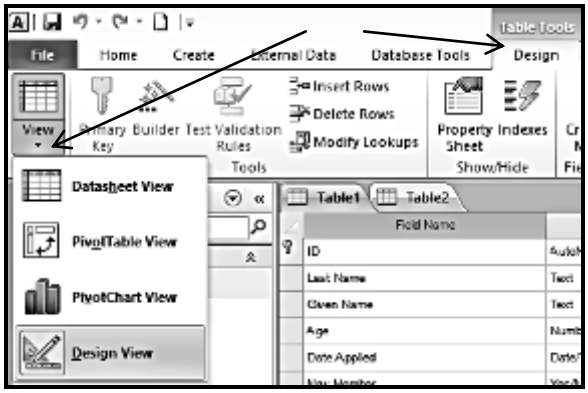


After Adding Data Type for Address and Comments.

B. Deleting a Field by using Datasheet View

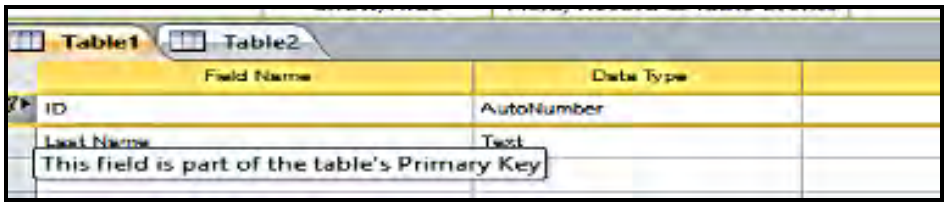
To delete a field in a Microsoft Access database, it might be necessary to delete the relationships between it and other tables. Fields can be deleted in a table using either the Datasheet View or Design View. Follow the steps to delete a Field using Datasheet View.

1. Select the table that has the ID Field you wish to delete.
2. Switch to Design View by Clicking on the **Fields** tab. Select **Views Group** and then **Views**.

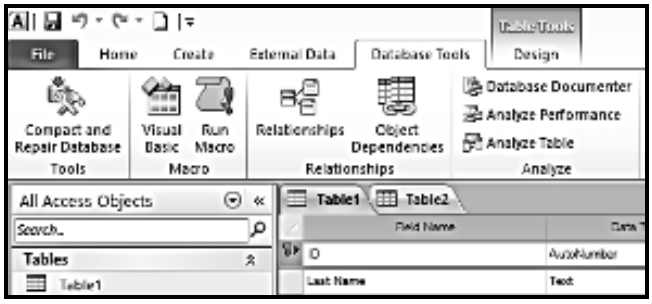


The Views Group

3. Select the ID if a yellow key appears next to it, it is a primary key, and you must first delete the relationships between it and other tables.

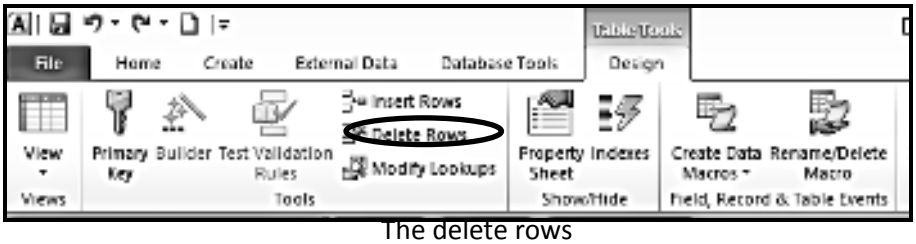


4. Go to the “Database Tools” tab and select “Relationships Group” the “Relationship”. The relationships will show. If your table is hidden, check “Show Hidden Objects” in the Navigation Options dialogue box.



The database tools

5. Select the Table, and then click on a relationship line between the ID field and another table. Press the "Delete Row" key to delete it. Repeat this procedure for each relationship the ID field has with other tables.



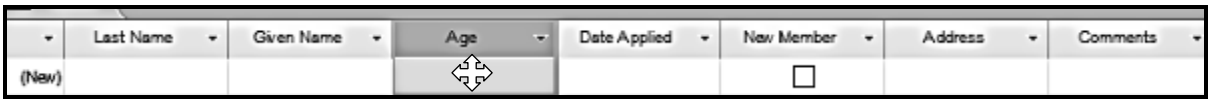
The delete rows

C. Moving a Field using Datasheet View

You can arrange the order of Fields in a table in Datasheet View or Design View by moving a field in a Microsoft Access database; follow the steps to move a Field using Datasheet View.

1. Locate the Field you wish to move, and then hover your mouse over the bottom border of the field header. Your cursor will become a four-sided arrow.

Age Field to the last Field.



2. Click and drag the Fields to its location.

3. Release your cursor. The field will appear in the location.

4. Again return or move the **Age Field** into its original Field by following steps 2 and 3.

5. Save your work.

Activity 11.5.3.2

To practice with Adding, Deleting and Moving Fields. Continue by adding two more Fields from previous practise exercise by following the instructions given.

1. Using Student 2, add **Expiry Date of Membership,** Data Type should be DATE and add **Gender**, Data Type is TEXT.
2. Delete **Date Applied** in the Field.
3. Move **Address** to the last Field.

11.5.3.3 Identifying and Entering Data in Fields

Every field in a table has properties. These properties define the field's characteristics and behavior. The most important property for a field is its **Data Type**. A field's data type determines what kind of data it can store. For example, a field whose data type is Text can store data that consists of either text or numerical characters, but a field whose data type is Number can store only numerical data.

A field's data type determines many other important field qualities, such as:

a. How you can use the field in expressions.

b. The maximum size of a field value.

c. Whether the field can be indexed.

d. Which formats can be used with the field.

When you create a field in Datasheet view, the field's data type is defined for you. If you create a field in Datasheet view by using a field template or by using an existing field from another table, the data type is already defined in the template or in the other table. If you create a field by entering data in Datasheet view, Microsoft Office Access assigns a data type to the field based on the values that you enter. If you enter values that are of different data types in the field, Access may prompt you to make a decision about the data type.

You can change the field's data type and its **Format**, **Indexed**, and **Required** field properties in **Datasheet view**. Follow the steps in entering Field's data type.

1. Create a field by entering data in an empty column.

2. Adjust the field's data type and other properties by using the **Datasheet** tab on the Ribbon.

Data types

Think of a field's data type as a set of qualities that applies to all the values contained in the field and that determines what kind of data those values can be. For example, values that are stored in a Text field can contain only letters, numbers, and a limited set of punctuation characters. In addition, a Text field can contain a maximum of 255 characters.

The table below represents the ten (10) data types in Access.

Data type	Use to store	Size
Text	Alphanumeric characters Use for text, or for numbers that are not used in calculations (for example, a product ID). A numeric value that is stored as text can be sorted and filtered more logically, but cannot	Up to 255 characters.

	be easily used in calculations.	
Memo	Alphanumeric characters (longer than 255 characters in length) or text that uses rich text formatting. Use for text that is more than 255 characters in length, or for text that uses rich text formatting. Notes, lengthy descriptions, and paragraphs that use text formatting, such as bold or italics, are good examples of where to use a Memo field.	Up to 1 gigabyte of characters, or 2 gigabytes of storage (2 bytes per character), of which you can display 65,535 characters in a control.
Number	Numeric values (integers or fractional values). Use for storing numbers that are used in calculations, except for monetary values (use the Currency data type for monetary values).	1, 2, 4, or 8 bytes, or 16 bytes when used for a replication ID.
Date/Time	Dates and times. Use for storing date/time values. Note that each value stored includes both a date component and a time component.	8 bytes.
Currency	Monetary values. Use for storing monetary values (currency).	8 bytes.
AutoNumber	A unique numeric value that Access automatically inserts when a record is added. Use for generating unique values that can be used as a primary key. Note that values for AutoNumber fields can be incremented sequentially or by a specified value, or assigned randomly.	4 bytes or 16 bytes when used for replication ID.
Yes/No	Boolean values (yes/no). You can use one of three formats: Yes/No, True/False, or On/Off.	1 bit (8 bits = 1 byte).
OLE Object	OLE objects or other binary data. Use for storing OLE objects from other Microsoft Windows programs.	Up to 1 gigabyte.
Attachment	Pictures, Images, Binary files, Office files. This is the preferred data type for storing digital images and any type of binary file.	For compressed attachments, 2 gigabytes. For uncompressed attachments,

		approximately 700kb, depending on the degree to which the attachment can be compressed.
Hyperlink	Hyperlinks. Use for storing hyperlinks to provide single-click access to Web pages through a URL (Uniform Resource Locator) or files through a name in UNC (universal naming convention) format. You can also link to Access objects stored in a database.	Up to 1 gigabyte of characters, or 2 gigabytes of storage (2 bytes per character), of which you can display 65,535 characters in a control.
Lookup Wizard	Not actually a data type; instead, this starts the Lookup Wizard. Use to start the Lookup Wizard so that you can create a field that uses a combo box to look up a value in another table, query, or list of values.	Table or query based: The size of the bound column. Value based: The size of the Text field used to store the value.

Creating additional Tables

A table is automatically created when you open a blank database. Follow the steps below on how to create additional tables.

1. Open Student database you have saved on page 73.

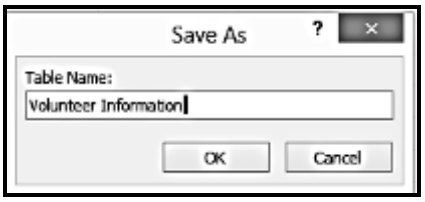
2. Click the **Create** tab at the top of the screen.

3. In the **Tables** group click **Table**.

   The **View** provides currently two views **Design View** and **Datasheet View**.

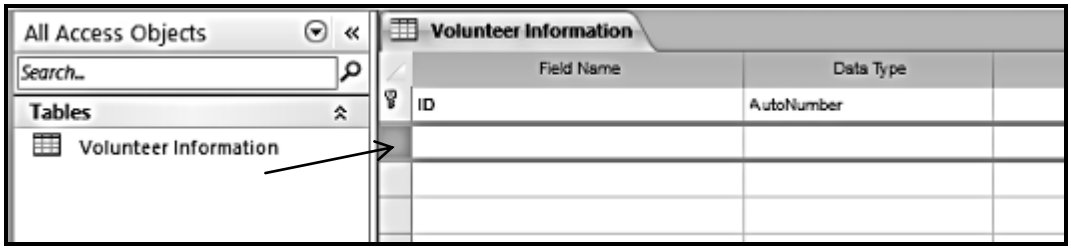
4. Click **Design View**.

5. **Save As** dialogue box will appear, Name it **Volunteer Information.**



If you look at the screen, you will see that the table is named **Volunteer Information**. Underneath you will see Fields named **Field Name**, **Data Type**, and **Description.**

Under Field Name skip the first row that has the key symbol and start typing in the second row.



a. Last Name

b. First Name

c. Office Number

d. Date Joined

e. Still a Member

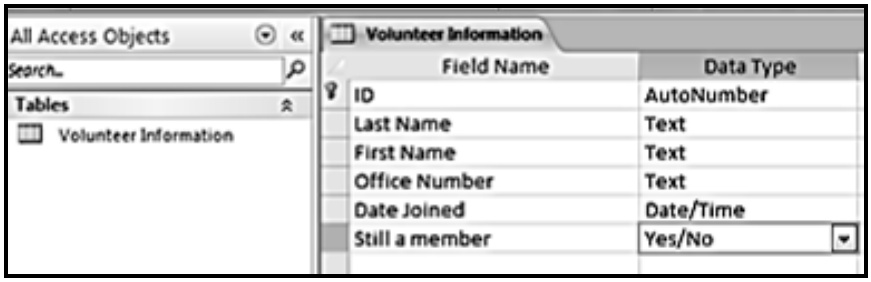
Observe that the Data Type column next to information you inputted automatically changes to the Text setting. We will change the Data Type for Date Joined and Still a Member.

6. Click in the cell next to **Date Joined**.

7. Click the arrow until you see the drop down menu.

8. Choose **Date/Time**.

9. Do the same for the cell next to **Still a Member** but select **Yes/No**.



After typing the Data Types

Activity 11.5.3.3

A. Create and enter Data Types for these given information.

1. Open Student database**.**

2. Follow the steps on page 81 on creating a table.

Field Name	Data Type
Last Name	Text
First Name	Text
Date Joined	Date/Time
New Member	Yes/No
Evaluation	Attachment

B. Write the steps in entering data types.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

11.5.3.4 Editing Fields and their Properties

From our previous Lesson 11.5.3.3 about entering data in a Field, every field in a table has properties. These properties define the field's characteristics and behaviour. The most important property for a field is its data type. A field's data type determines what kind of data it can store.
A field's data type determines many other important field qualities, such as:

- the field in expressions,
- the maximum size of a field value,
- whether the field can be indexed and
- if formats can be used with the field.

Data type reference
The following section contains detailed information about data types —their purpose and how they work.

1. Attachment
2. AutoNumber
3. Currency
4. Date/Time
5. Hyperlink
6. Memo
7. Number
8. OLE Object
9. Text
10. Yes/No

1. Attachment

The purpose of Attachment Field is to attach multiple files, such as images, to a record. Suppose that you have a job contacts database. You can use an attachment field to attach a photo of each contact, and you can also attach one or more resumes for a contact to the same field in that record.

For some file types, Access compresses each attachment as you add it.

Types of attachments that Access compresses

When you attach any of the following file types, Access compresses the file.

- Bitmaps, such as .bmp files
- Windows Metafiles, including .emf files
- Exchangeable File Format files (.exif files)
- Icons
- Tagged Image File Format files

You can attach many different types of files to a record, but some file types that may pose security risks are blocked. As a rule, you can attach any file that was created in one of the 2007 Microsoft Office system programs. You can also attach log files (.log), text files (.text, .txt), and compressed .zip files.

2. AutoNumber

The purpose of Auto Number Field is to provide a unique value that serves no other purpose than to make each record unique. The most common use for an AutoNumber field is as a primary key, especially when no suitable natural key (a key that is based on a data field) is available.

An AutoNumber field value requires 4 or 16 bytes, depending on the value of its **Field Size** property.

Suppose that you have a table that stores contacts' information. You can use contact names as the primary key for that table, but how do you handle two contacts with exactly the same name? Names are unsuitable natural keys, because they are often not unique. If you use an AutoNumber field, each record is guaranteed to have a unique identifier.

With this AutoNumber you should not use an AutoNumber field to keep a count of the records in a table. AutoNumber values are not reused, so deleted records can result in gaps in your count. Moreover, an accurate count of records can be easily obtained by using a Totals row in a datasheet.

This setting makes AutoNumber fields compatible with other Long Integer Number fields when they are used in relationships or joins. Each field value requires 4 bytes of storage.

The **Replication ID** field size is used for AutoNumber fields that are used as replication IDs in a database replica. Do not use this value unless you are working in or implementing the design of a replicated database. Each field value requires 16 bytes of storage.

3. Currency

The purpose of Currency Field is store monetary data. Data in a Currency field is not rounded off during calculations. A Currency field is accurate to 15 digits to the left of the decimal point and 4 digits to the right. Each Currency field value requires 8 bytes of storage. The label text that is displayed for this field by default in forms, reports, and queries. If this property is empty, the name of the field is used. Any text string is allowed.

4. Date/Time

The purpose of Date/Time Field is to store time-based data. The label text that is displayed for this field by default in forms, reports, and queries. If this property is empty, the name of the field is used. Any text string is allowed.

5. **Hyperlink**
   The purpose of Hyperlink Field is to store a hyperlink, such as an e-mail address or a Web site URL. A hyperlink can be a UNC path or a URL. It can store up to 2048 characters. Allows entry (by setting to Yes) of a zero-length string ("") in a Hyperlink, Text, or Memo field.

6. **Memo**
   The purpose of Memo Field is to store a block of text that is more than 255 characters in length and is formatted text.

7. **Number**
   The purpose of Number Field is to store a numeric value that isn't a monetary value. If you might use the values in the field to perform a calculation, use the Number data type.

8. **OLE Object**
   The purpose of OLE Object Field is to attach an OLE Object, such as a Microsoft Office Excel spreadsheet, to a record. If you want to use OLE features, you must use the OLE Object data type.

   In most cases, you should use an Attachment field instead of an OLE Object field. OLE Object fields support fewer file types than Attachment fields support. In addition, OLE Object fields do not allow you to attach multiple files to a single record.

9. **Text**
   The purpose of Text Field is to store up to 255 characters of text.

10. **Yes/No**
    The purpose of Yes/No is to store a Boolean value. The label text that is displayed for this field by default in forms, reports, and queries. If this property is empty, the name of the field is used. Any text string is allowed.

Field Properties

After you create a field, you can set field properties to control its appearance and behaviour. For example, by setting field properties, you can:

- Control the appearance of data in a field
- Help prevent incorrect data entry in a field
- Specify default values for a field
- Help speed up searching and sorting on a field

You can set some of the available field properties while you work in Datasheet View. To have access to and set the complete list of field properties; however, you must use Design View.

Set field properties in Datasheet View
You can rename a **Field**, change its data type, change its **Format** property, and change some of a field's other properties while you work in Datasheet view.

Open a table in Datasheet view
Follow the steps on how to open a table in Datasheet View.

1. In the Navigation Pane, right-click the table that you want to open.

2. On the shortcut menu, click **Datasheet view**.

Rename a Field
When you add a field by entering data in Datasheet view, Access automatically assigns a generic name to the field. Access assigns the name Field1 to the first new field, Field2 to the second new field, and so on. By default, a field's name is used as its label wherever the field is displayed, such as a column heading on a datasheet. Renaming fields so that they have more descriptive names helps make them easier to use when you view or edit records. Follow the instructions on how to rename a Field.

1. Right-click the heading of the Field that you want to rename (for example, Field1).

2. On the shortcut menu, click **Rename Column**.

3. Enter the new name in the field heading.

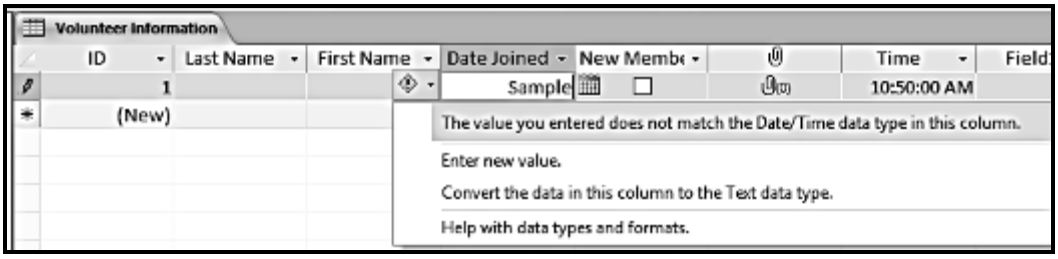
Field names can consist of up to 64 characters (letters or numbers), including spaces.

Change a Field's Data Type
When you create a field by entering data in Datasheet view, Access examines that data to determine the appropriate data type for the field. For example, if you enter **1/1/2015**, Access recognizes that data as a date and sets the data type for the field to Date/Time. If Access cannot definitively determine the data type, the data type is set to Text by default.

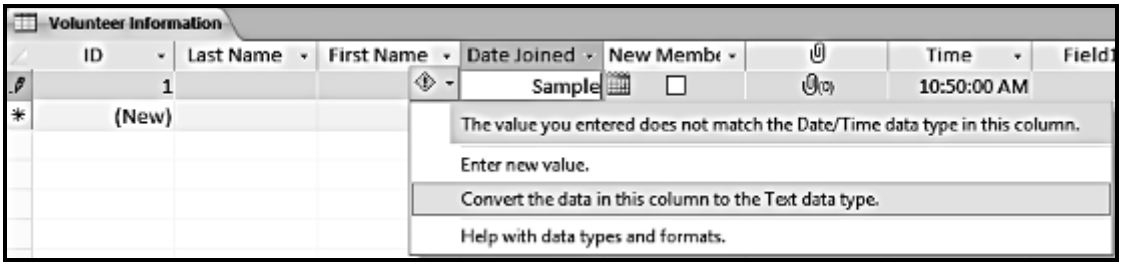
The data type of the field determines which other field properties you can set. For example, you can set only the **Append Only** property for a field that has the Hyperlink data type or the Memo data type.

There may be cases where you want to manually change a field's data type. For example, suppose you type **Sample** into a new Field instead of a **Date**. The automatic data type detection feature selects the Date/Time data type for the field. Because **Date Joined** is label, and not dates, you should use the Text data type. Use the following procedure to change a field's data type. Follow the steps on how to change a Field's Data type manually.

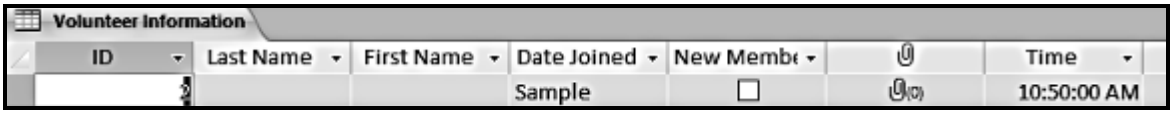
1. On the Ribbon, click the **Datasheet** tab.
2. Type **Sample,** into a new Field. Observe the message that will appear into your screen to ask you to change the Field property.



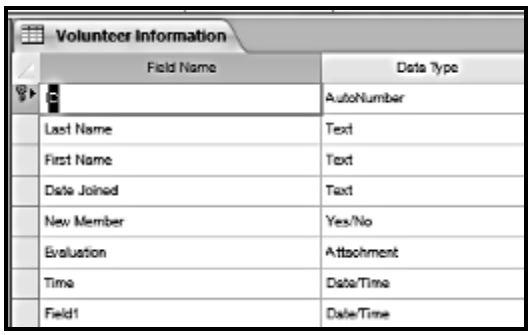
3. Select **Convert the data in this column to the Text data type**.



4. Press **Enter** to confirm.



5. Click the **Design View** to see the changes of the Field, from Date/Time to Text property.



Activity 11.5.3.4

Perform the practice activity below to test your skills on editing fields and their properties.

Write the steps in editing Fields and their properties manually.

1. _____

2. _____

3. _____

4. _____

11.5.3.5 Getting External Information

The External Information is data that is stored in another program, and you would like to import that data into a new table or append it to an existing table in Access. Or you might work with people who keep their data in other programs, and you want to work with it in Access by linking to it. Either way, Access makes it easy to work with data from other sources. You can import data from an Excel worksheet, from a table in another Access database, from a Windows SharePoint Services 3.0 list, or from a variety of other sources.

The data that you have been collecting in another program that you would like to use in Access. Perhaps you work with people who store their data in other programs, and you want to work with their data in Access. Or, maybe you have multiple disparate sources of data, and need a "landing pad" where you can bring them all together for deeper analysis.

Access makes it easy to import or link data from other programs. You can bring in data from an Excel worksheet, from a table in another Access database, from a SharePoint list, or from any of a variety of other sources.

Import an Excel worksheet into Access
Many people begin to explore Access after first building a list in Excel. Excel is a great place to start a list, but as the list grows, it becomes harder to organize and keep updated. Moving the list to Access is usually the next logical step

A database table is similar in structure to a worksheet, in that data is stored in rows and columns. As a result, it is usually easy to import a worksheet into a database table. The main difference between storing your data in a worksheet and storing it in a database is in how the data is organized. Simply importing your entire worksheet as a new table in a database will not solve the problems associated with organizing and updating your data, particularly if your worksheet contains redundant data. To solve those problems, you must split the spreadsheet data into separate tables, each one containing related data.

Access features the Table Analyser Wizard, which can help you to complete this process. After importing your data into a table, the wizard helps you to split the table into separate tables, each of which contains data that is not duplicated in any of the other tables. The wizard also creates the necessary relationships between the tables.

The following table shows the formats that can be imported into, linked to, or exported out of Access:

Program or format	Import allowed?	Linking allowed?	Exporting allowed?
Microsoft Office Excel	Yes	Yes	Yes
Microsoft Office Access	Yes	Yes	Yes
ODBC Databases	Yes	Yes	Yes

(For example, SQL Server)			
Text files (delimited or fixed-width)	Yes	Yes	Yes
XML Files	Yes	No	Yes
PDF or XPS files	No	No	Yes
E-mail (file attachments)	No	No	Yes
Microsoft Office Word	No, but you can save a Word file as a text file and then import the text file.	No, but you can save a Word file as a text file and then link to the text file.	Yes (you can export as Word Merge or as Rich Text)
SharePoint List	Yes	Yes	Yes
Data Services (see note)	No	Yes	No
HTML Documents	Yes	Yes	Yes
Outlook Folders	Yes	Yes	No, but you can export as a text file, and then import the text file into Outlook.
dBase files	Yes	Yes	Yes

Import an Excel worksheet as a table in a new database

First type the given data into your MS Excel, and save as a filename **StudentFile.**

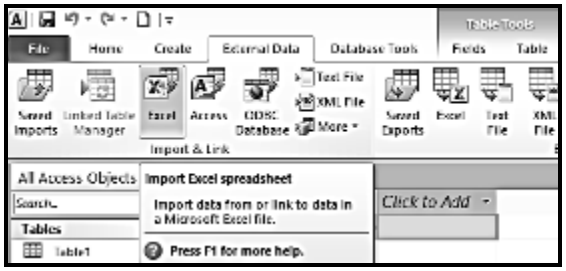
	A	B	C	D
1	Last Name	Given Name	Grade	Class
2	Kila	George	9	P
3	Roger	Kenny	11	G
4	Abe	Michael	12	U
5	Jones	Hilda	9	N
6	Henry	Mcray	10	P

1. On the **File** tab, click **New**, and then click **Blank Database**.

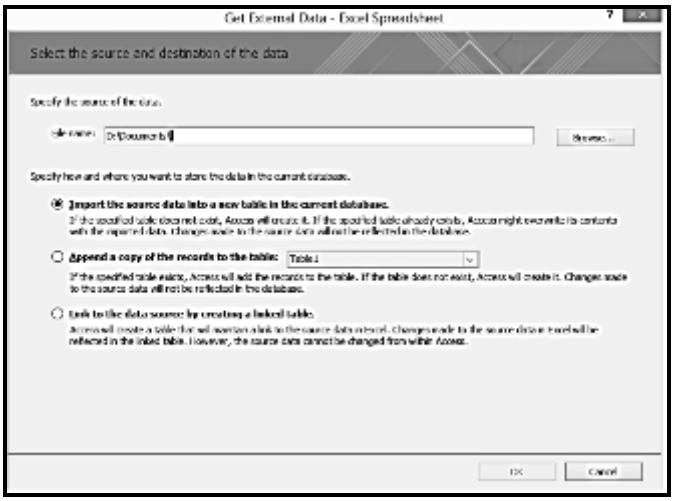
2. Type a name for the new database in the **File Name** box **Import Files**, and then click **Create**. The new database opens, and Access creates a new empty table, Table1.

3. Close Table1. When asked if you want to save changes to the design of Table1, click **No**.

4. On the **External Data** tab, in the **Import & Link** group, click **Excel**.



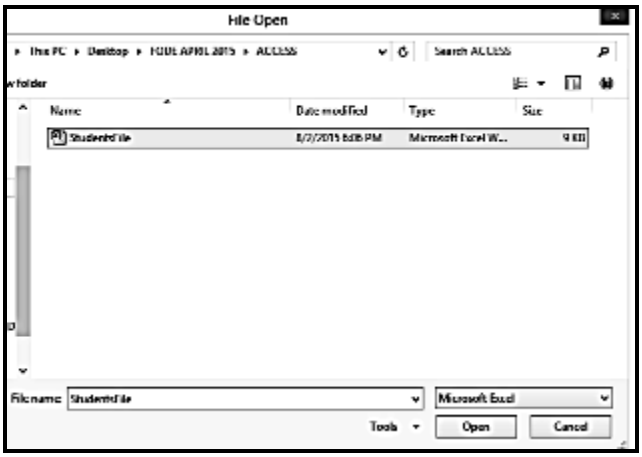
5. In the **Get External Data** dialogue box, click **Browse**.



To external data in Excel Spreadsheet

6. Use the **File Open** dialogue box to locate your file.

7. Select the file, and then click **Open**.

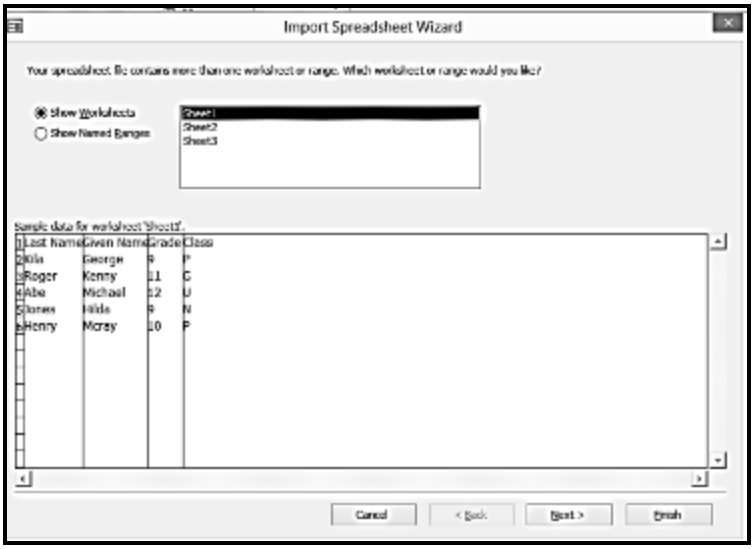


To open file in MS Excel

8. In the Get External Data dialogue box, ensure that **Import** the source data into a new table in the current database option is selected.

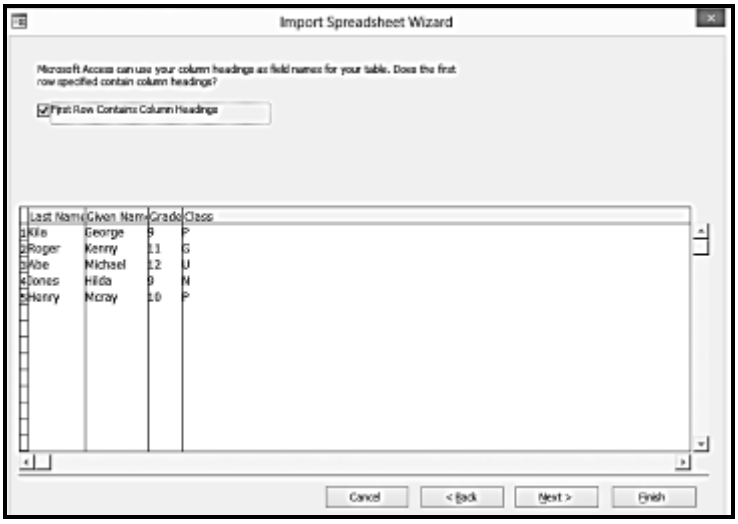
9. Click **OK.**

The Import Spreadsheet Wizard starts, and asks you a few questions about your data.

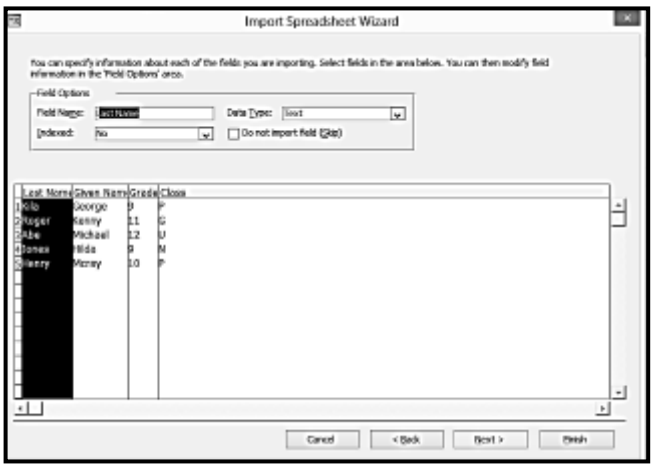


The Import Spreadsheet wizard

10. Follow the instructions, clicking **Next** or **Back** to navigate through the pages.

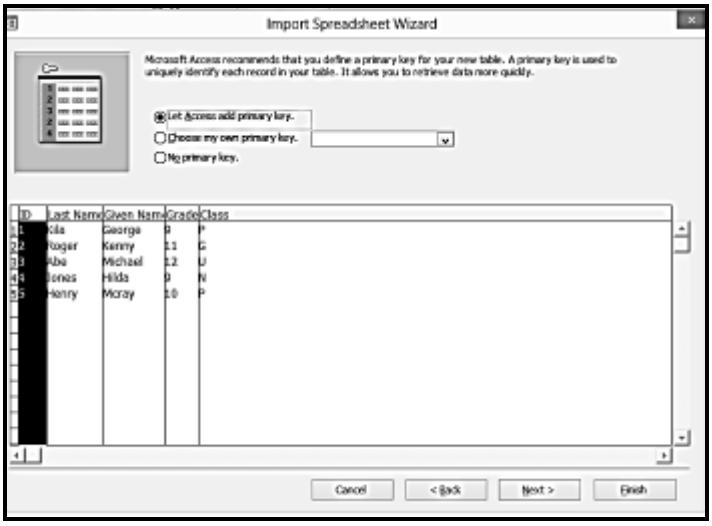


11. Tick the box, and click **Next**.



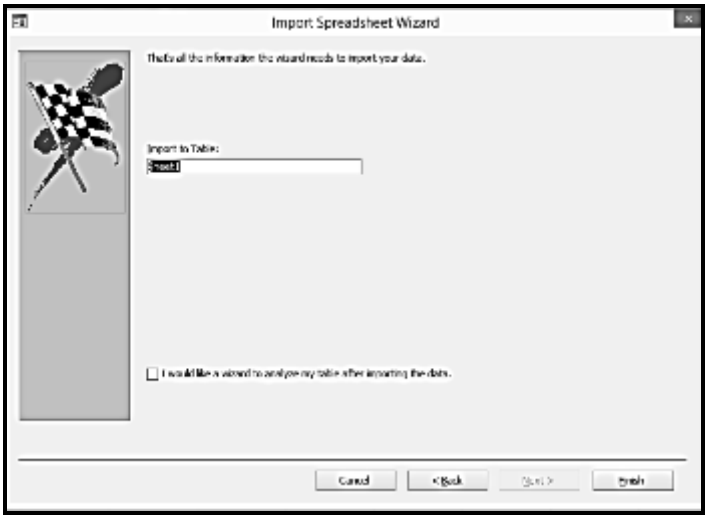
The Import Spreadsheet wizard

12. Click **Next**.



The import spreadsheet wizard

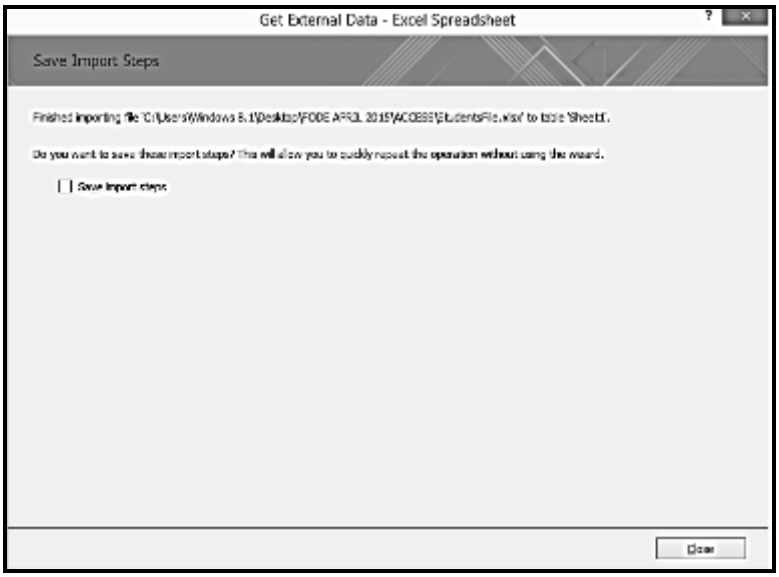
13. In this step you have to decide about choosing for the Primary Key. Let us use the **first** option wherein the Access will add the Primary Key for this practice. And click **Next**.



Import to table

14. On the last page of the wizard, click **Finish**.

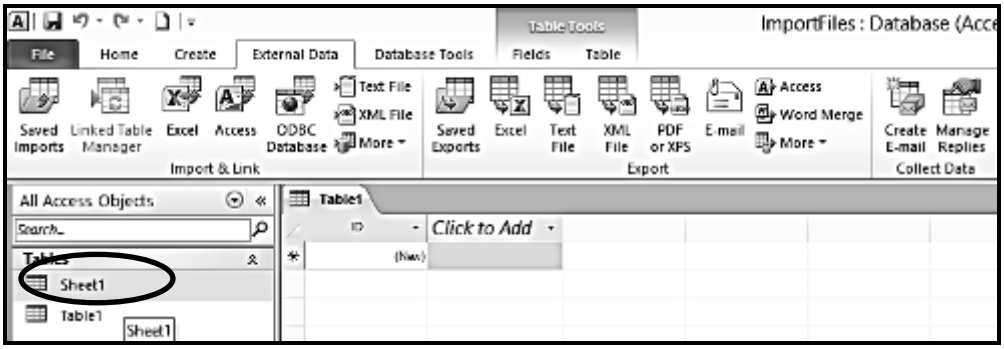
    Access asks whether you want to save the details of the import operation that you just completed. If you think that you will be performing this same import operation again, click **Yes**, and then enter the details. You can then easily reproduce the operation in the future by clicking **Saved Imports** in the **Import** group on the **External Data** tab. If you do not want to save the details of the operation, click **Close**.



To Get external data in MS Excel

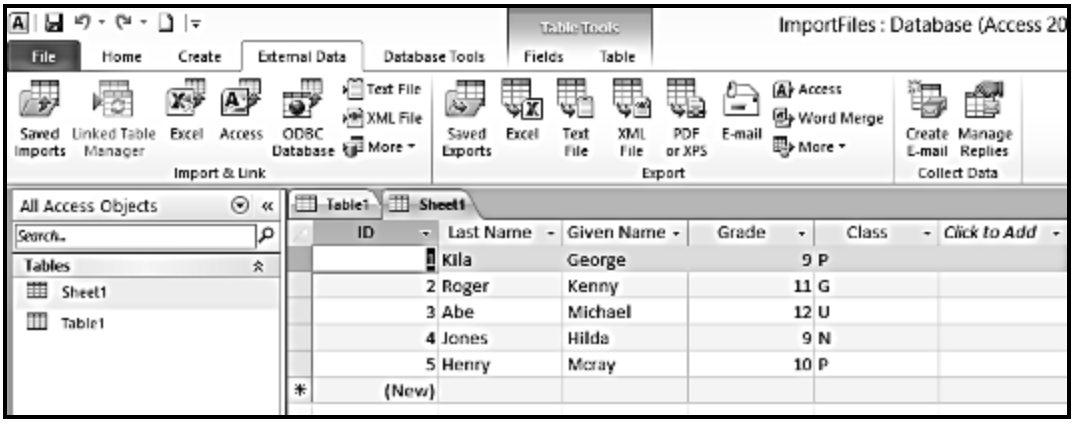
Access imports the data into a new table, and then displays it under **All Tables** in the Navigation Pane.

After closing the steps, this is how your Access will be looked like after Importing Files from Excel.



External Data in Sheet 1

15. By double clicking your mouse the Sheet1 data will appear.



Sheet 1 result

Activity 11.5.3.5

Perform the practice activity to test your ability to Import an MS Excel into database.

A.

Write the steps on how to Import an Excel worksheet as a table in a new database.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

B. Practical Activity on Importing

1. Type the following in MS Excel.

	A	B	C	D
1	**Last Name**	**Given Name**	**Class**	**Gender**
2				
3	Maho	Mary Jane	10B	F
4	Augustus	Patrick	11A	M
5	Peter	McRay	9G	M
6	Santos	MaryKris	12P	F
7				

2. Save this in MS Excel **StudentActivity.**

3. Import this file in MS Access.

11.5.3.6 Managing Relationships

Data types in relationships and joins

A table relationship is an association that is established between common fields (columns) in two tables. A relationship can be one-to-one, one-to-many, or many-to-many.

A join is an SQL operation that combines data from two sources into one record in a query record set on the basis of values in a specified field that the sources have in common. A join can be an inner join, a left outer join, or a right outer join. When you create a table relationship or add a join to a query, the fields that you connect must have the same or compatible data types. For example, you cannot create a join between a Number field and a Text field, even if the values in those fields match.

You cannot change the data type or the **Field Size** property of a field that is involved in a table relationship. You can temporarily delete the relationship to change the **Field Size** property, but if you change the data type, you will not be able to re-create the relationship without first also changing the data type of the related field.

Recall that one of the main characteristics of relational databases is the fact that all tables are related to one another. In the Bank database thus far, the Customers table is related to the Accounts table by virtue of the CustomerID field appearing in both tables. Access has a means to make this relationship explicit using the Relationships screen. Access uses this information when designing reports, forms and queries that require more than one table to be displayed. Let us try to follow the steps to create a relationship.

1. Open and create new database with a filename **Accounts.** Then, let us create **Table1** using the following data:

Customer ID	First Name	Last Name	Street Address	Phone Number
0001	David	Jonathan	Angau Dr, Boroko	710-000-123
0002	Daisy	Homoka	6 Mile, Gordon	723-111-538
0003	Honeylette	Joyce	Stage3, Gerehu	701-987-987
0085	Mary	Umbu	Vaivai Ave, Boroko	711-534-938

2. Then after typing this, save this **Table1 as Customer. Customer ID** will be the **Primary Key** for this table.

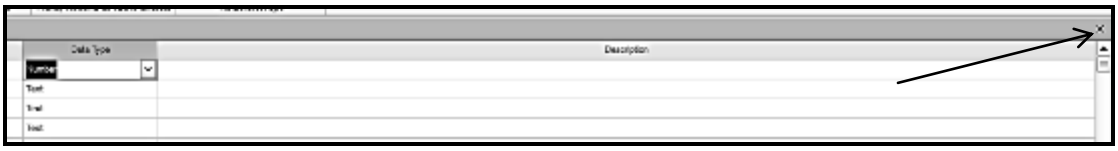
3. Let us create **Table2** using the following data:

Customer ID	Account No.	Account Type	Date Opened	Balance
0001	1-00-238	Savings	1/10/2001	1000.90
0002	3-80-939	Savings	4/09/2010	827.04
0003	0-92-987	Cheque	7/11/2013	10987.89
0085	2-93-657	Cheque	26/7/2005	6839.45

4. Then after typing this **Table2**, save this in **Table2** as **Accounts. Account Number** will be the Primary Key for this table.

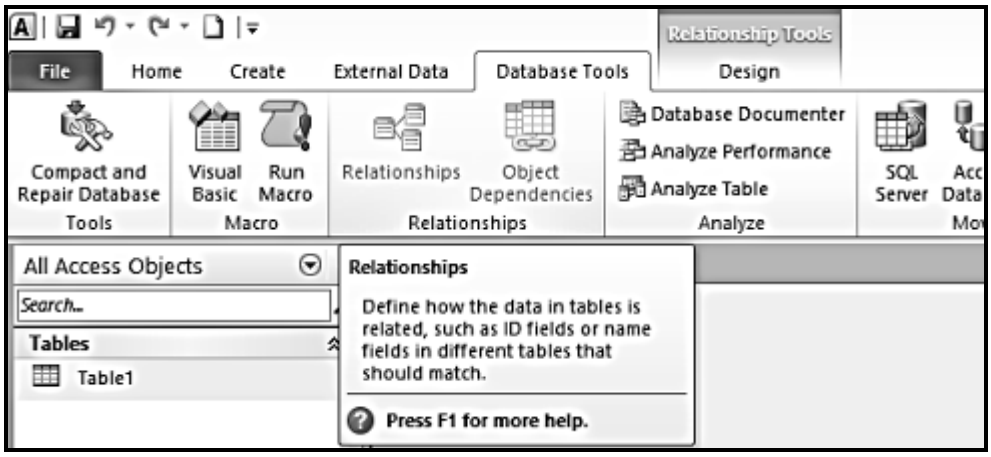
Follow the steps on **creating table relationships**

1. To get started, make sure the Accounts table and the Customer table are both closed. Access will halt creation of any relationships if the table are currently opened. To close a table, either right-click on the table name in the tab above the table and choose the close menu item, or click the small **X** to right above the table. Suppose we created two new files in Access.



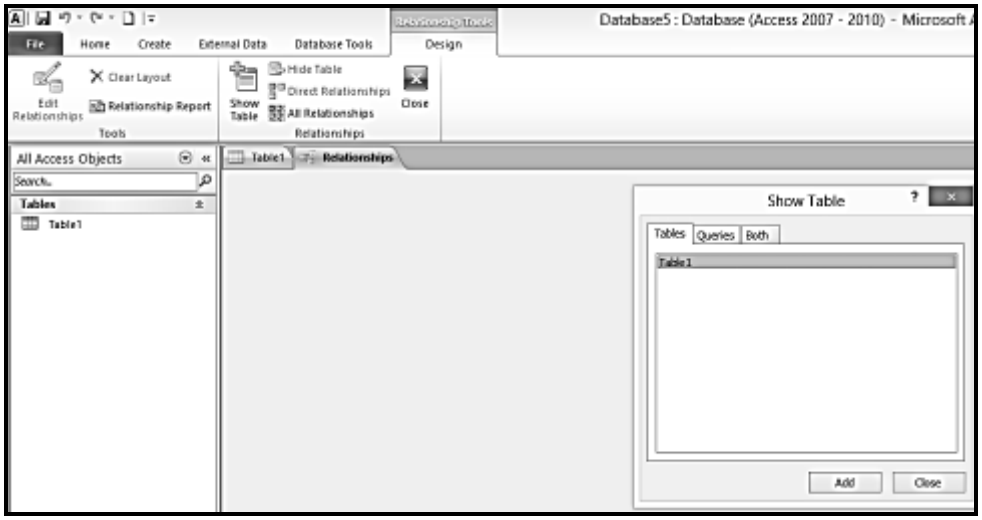
To close a table

2. Next, display the Relationships screen by clicking on the **Database Tools** tab and then click on the **Relationships** button as shown below.



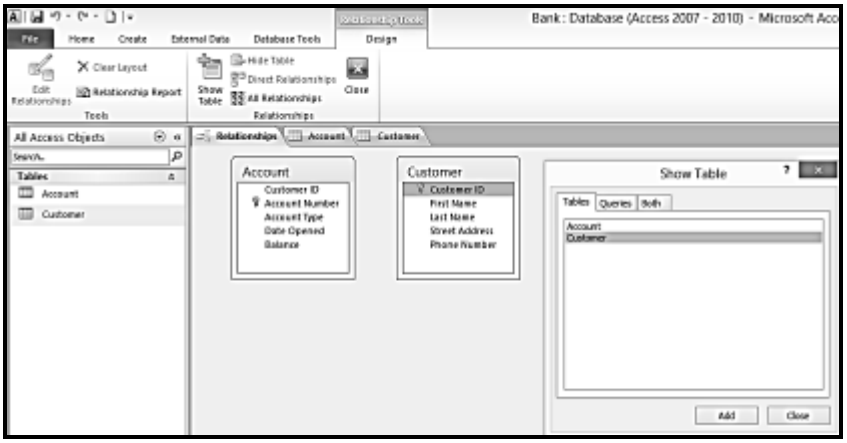
The Relationship Tool

3. The blank Relationships screen will appear as follows:



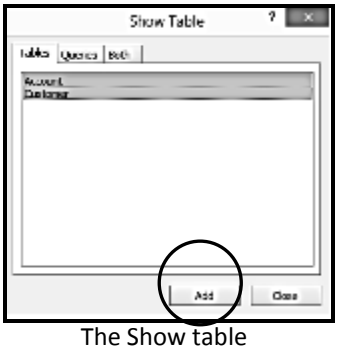
The Relationships

4. Click **Show Table** from the **Design** Relationship Tools tab. And select tables **Account** and **Customer.**



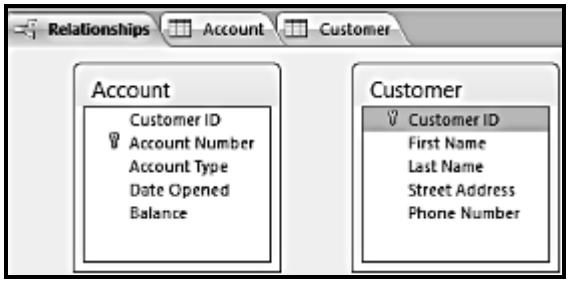
The Design relationship

5. The Show Table dialogue box will appear by default. Highlight both the Customers table and the Accounts table as shown below and then click on the Add button.



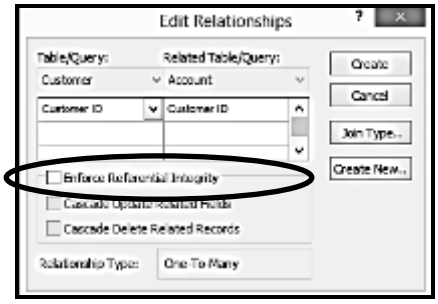
The Show table

6. Then click on the Close button to close this dialogue box. The Relationships screen will now reappear with the two tables displayed as below:



The relationship screen

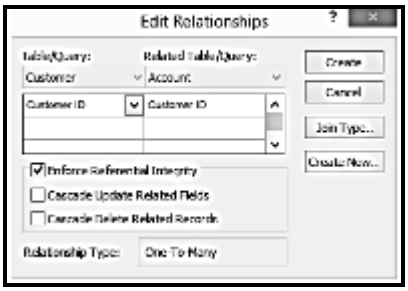
7. To connect the Customers table with the Accounts table to form a relationship, click on the **CustomerID** field in the **Customers** table and drag it over on top of the **CustomerID** field on the **Accounts** table. Upon releasing the mouse button, the Edit Relationships dialogue box will appear as below:



The Edit relationships

Access will do its best to determine the Relationship Type (almost always it will select *One-to-Many*). For this example, Access knows that CustomerID is a key of the Customer table so it chooses this field as the **One** side. This makes the Accounts table the **Many** side as **One** customer may have **Many** accounts.

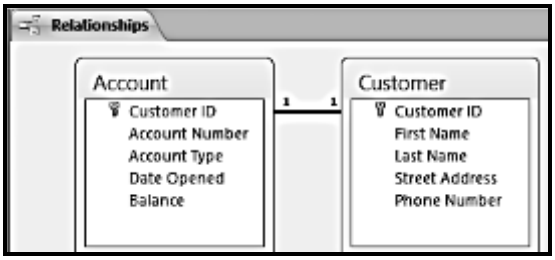
8. One additional step to be taken is the check off the box with the label **Enforce Referential Integrity**.



The Edis relationships with Enforce Referential Integration

This option puts constraints into effect such that an Accounts record cannot be created without a valid Customer record, and Access will also prevent a user from deleting a Customer record if a related Accounts record exists.

9. Click on the Create button to create the relationship. The **Relationships** screen should reappear with the new relationship in place as follows:



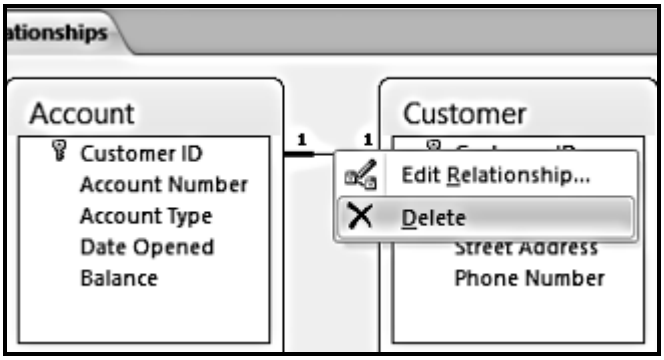
The Relationships

If the relationship does not appear in the above fashion, highlight it and press the delete key to delete it. Then go back to the table design view and make certain that the CustomerID field is designated as the key of the Customers table. Then go back to the Relationships screen and try to recreate the relationship.

To delete relationships between tables:
Sometimes you will need to delete relationships that you have already defined in Microsoft Access. It could be that these relationships are no longer valid or you need to build new relationships or it could even be that you have entered it by mistake. Whatever be the reason, to delete a relationship, in relationships document tab, you need to delete the relationship line.

Follow the given steps to delete a relationship

1. Pull down the Tools menu and select the Relationships menu item.
2. To display tables, right click and choose Add Tables.
3. To create new relationships, drag a key field from one table and drop it on the associated field in another table
4. To edit an existing relationship, double click on the relationship line.
5. To delete an existing relationship, click on the relationship line and press the delete key.



The Edit relationships

6. Click **Yes** to confirm to permanently delete the selected relationship from the database.

To permanently delete the selected relationship

Importance of using relationships
Keeping data separated in related tables produces the following benefits:

- **Consistency** Because each item of data is recorded only once, in one table, there is less opportunity for ambiguity or inconsistency. For example, you store a customer's name only once, in a table about customers, rather than storing it repeatedly (and potentially inconsistently) in a table that contains order data.

- **Efficiency** Recording data in only one place means you use less disk space. Moreover, smaller tables tend to provide data more quickly than larger tables. Finally, if you do not use separate tables for separate subjects, you will introduce null values (the absence of data) and redundancy into your tables, both of which can waste space and impede performance.

- **Comprehensibility** The design of a database is easier to understand if the subjects are properly separated into tables.

Activity 11.5.3.6

Perform the practice activity below to test your understanding about Managing relationships.

Write the steps on how to create table relationships.

1._____

_____

_____

2._____

_____

_____

3._____

_____

_____

4._____

_____

_____

5._____

_____

_____

6._____

_____

_____

7._____

_____

_____

Summative Activities 11.5.3

A. Create Tables in Table Design and Datasheet View

1. Type the following data into your blank database. Make a filename **Admin Records.**

Student No.	Last Name	First Name	Grade	Class	Date of Birth	Province
0011	Jones	Henry	12	A	2/12/1995	NCD
0024	Lakoro	Jane	11	B	6/9/1994	Lae
0056	Maella	Dane	12	A	7/10/1994	Hagen
0085	Abi	Shane	11	C	6/6/1996	Goroko
0091	Lahui	Ben	11	A	5/11/1995	Rabaul

2. Save this in your Table1 as **Dept Records.**

3. Type this data in MS Excel.

	A	B	C	D
1	Student N	Date Borro	Overdue	Fine
2	11	11/3/2015	YES	K20
3	24	10/4/2015	NO	K0
4	56	9/3/2015	YES	K30
5	85	17/2/2015	YES	K50
6	91	22/2/2015	YES	K80

4. Save your file in MS Excel **Library Records.**

5. Create another blank database and save this with the filename **Admin Records**.

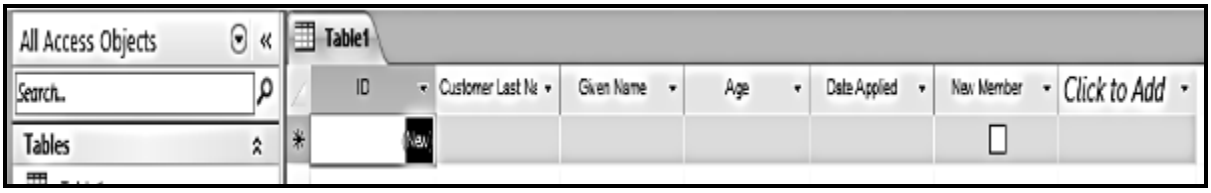
6. Link the filenames **Dept Records** and **Library Records** to **Admin Records.**

7. Create table relationships for the two filenames, **Student No.** as the Primary Key.

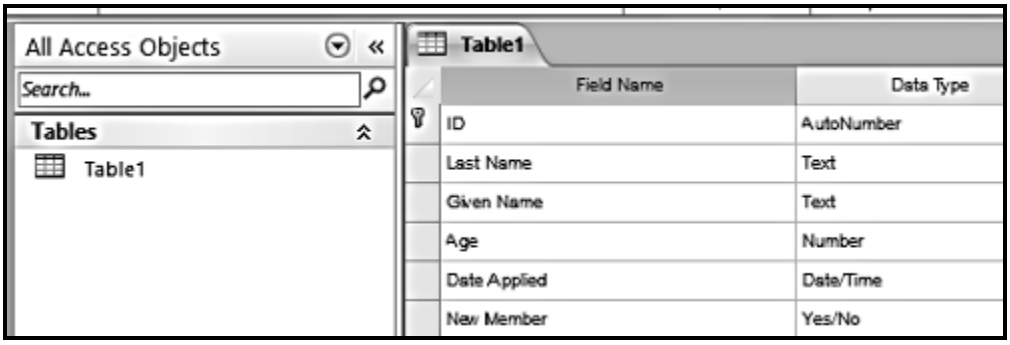
Answers to Learning Activities 11.5.3

Activity 11.5.3.1

A.



B.



Activity 11.5.3.2

1.

After adding two more Fields

2.

After deleting **Date Applied** Field

3.

After moving the **Address** Field

Activity 11.5.3.3
A.

Field Name	Data Type
ID	AutoNumber
Last Name	Text
First Name	Text
Date Joined	Date/Time
New Member	Yes/No
Evaluation	Attachment

B.

1. A table is automatically created when you open a blank database. For creating additional tables click the **Create** tab at the top of the screen.

2. In the **Tables** group click **Table**.

3. The **View** provides currently two views **Design View** and **Datasheet View**. Click **Design View**.

4. **Save As** dialogue box will appear, Name it **Volunteer Information3.**

5. Click in the cell next to **Date Joined**.

6. Click the arrow until you see the drop down menu.

7. Choose **Date/Time**.

8. Do the same for the cell next to **Still a Member** but select **Yes/No**.

Activity 11.5.3.4

Steps in editing Fields and their properties manually.

1. On the Ribbon, click **the Datasheet** tab.

2. Type **Sample**, into a new Field. Observe the message that will appear into your screen to ask you to change the Field property.

3. Select **Convert the data in this column to the Text data type.**

4. Press Enter to confirm.

Activity 11.5.3.5

A.

1. Type a name for the new database in the **File Name** box and then click **Create**.

   The new database opens, and Access creates a new empty table, Table1.

2. Close Table1. When asked if you want to save changes to the design of Table1, click **No**.

3. On the **External Data** tab, in the **Import & Link** group, click **Excel**. 

4. In the **Get External Data** dialogue box, click **Browse**.

5. Use the **File Open** dialogue box to locate your file.

6. Select the file, and then click **Open**.

7. In the **Get External Data** dialogue box, ensure that the **Import the source data into a new table in the current database** option is selected.

8. Click **OK**.

   The Import Spreadsheet Wizard starts, and asks you a few questions about your data.

9. Follow the instructions, clicking **Next** or **Back** to navigate through the pages.

10. Tick the box, and click **Next**.

11. Click **Next**.

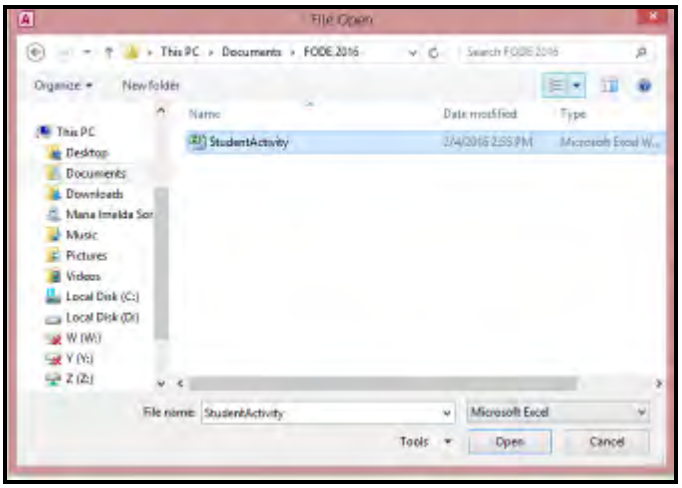
12. In this step you have to decide about choosing for the Primary Key. Let us use the **first** option wherein the Access will add the Primary Key for this practice. And click **Next**.

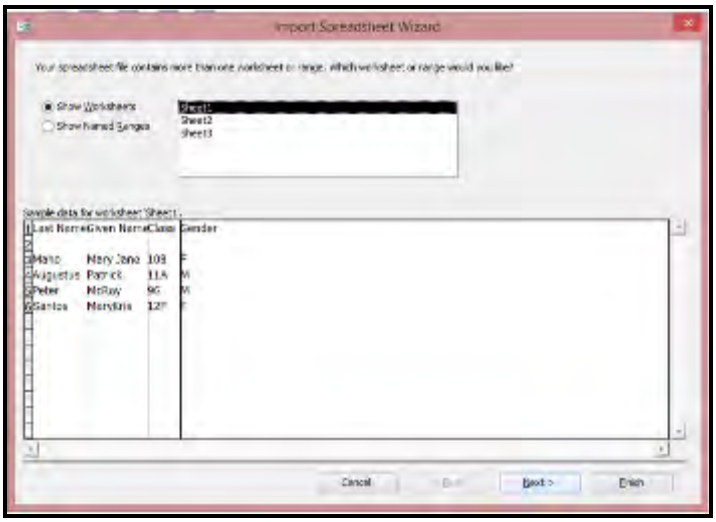
13. On the last page of the wizard, click **Finish**.

14. Access asks whether you want to save the details of the import operation that you just completed. If you think that you will be performing this same import operation again, click **Yes**, and then enter the details. You can then easily reproduce the operation in the future by clicking **Saved Imports** in the **Import** group on the **External Data** tab. If you do not want to save the details of the operation, click **Close**.

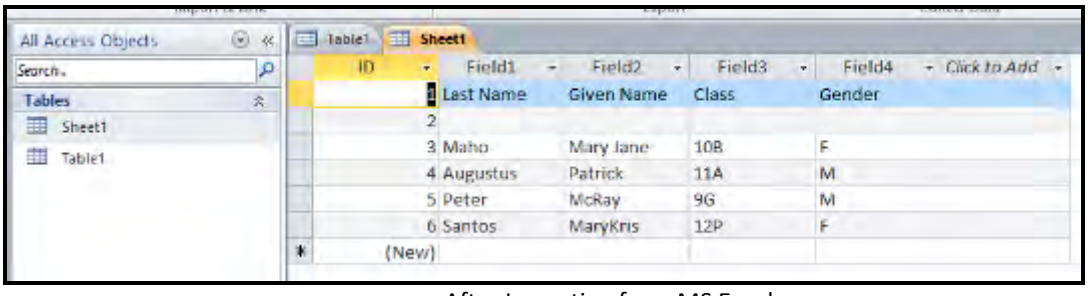
15. By double clicking your mouse the Sheet1 data will appear.

B.





Click **Next**.



After Importing from MS Excel

Activity 11.5.3.6

1. To get started, make sure the Accounts table and the Customer table are both closed. Access will halt creation of any relationships if the table are currently opened. To close a table, either right-click on the table name in the tab above the table and choose the close menu item, or Click the small **X** to right above the table. Suppose we created two new files in Access.

2. Display the Relationships screen by clicking on the **Database Tools** tab and then click on the **Relationships** button.

3. Click **Show Table** from the **Design** Relationship Tools tab. And select tables **Table1** and **Table2.**

4. The Show Table dialogue box will appear by default. Highlight both the Customers table and the Accounts table as shown below and then click on the Add button.

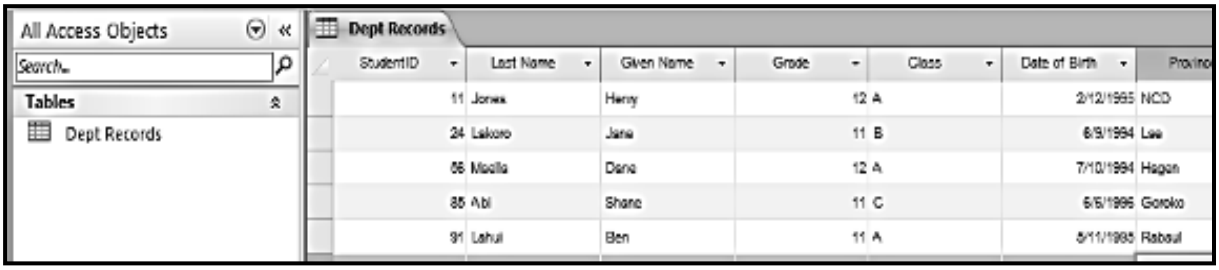
5. Then click on the Close button to close this dialogue box. The Relationships screen will now reappear with the two tables displayed as below:

6. To connect the two tables to form a relationship, click on the **CustomerID** (data from **Table1)** field and drag it over on top of the **CustomerID** (data from **Table2**). Upon releasing the mouse button, the Edit Relationships dialogue box will appear as below:

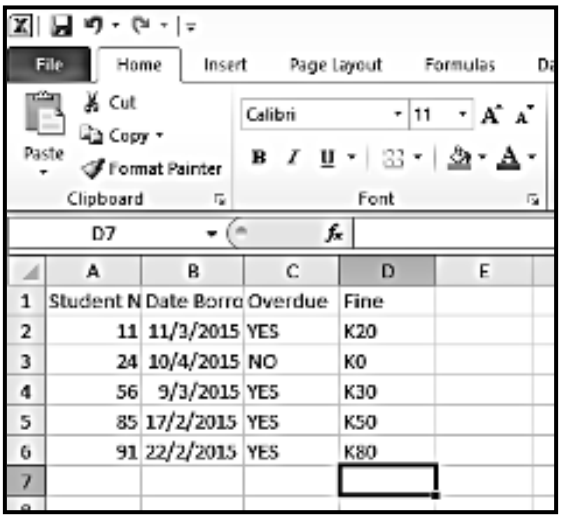
7. One additional step to be taken is the check off the box with the label **Enforce Referential Integrity**.

Answers to Summative Activities 11.5.3

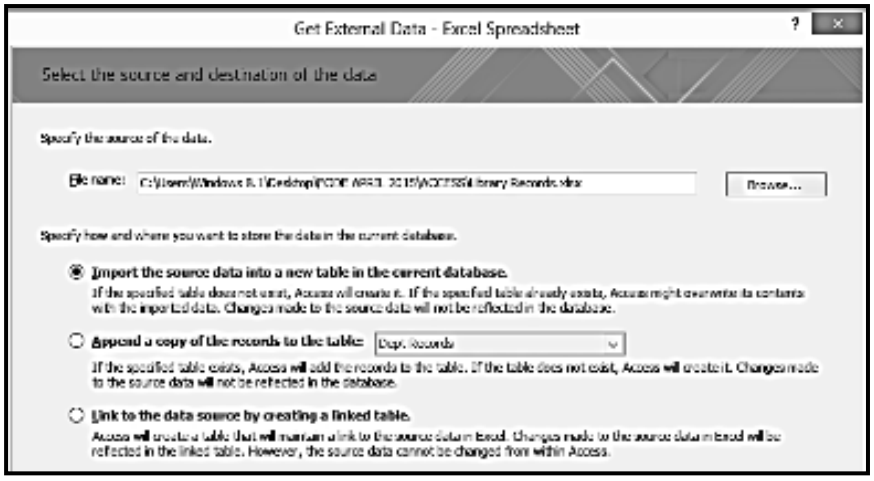
1.

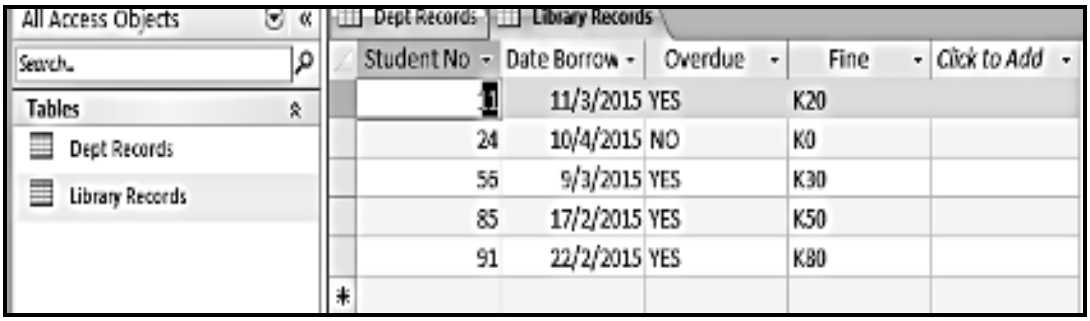


3.



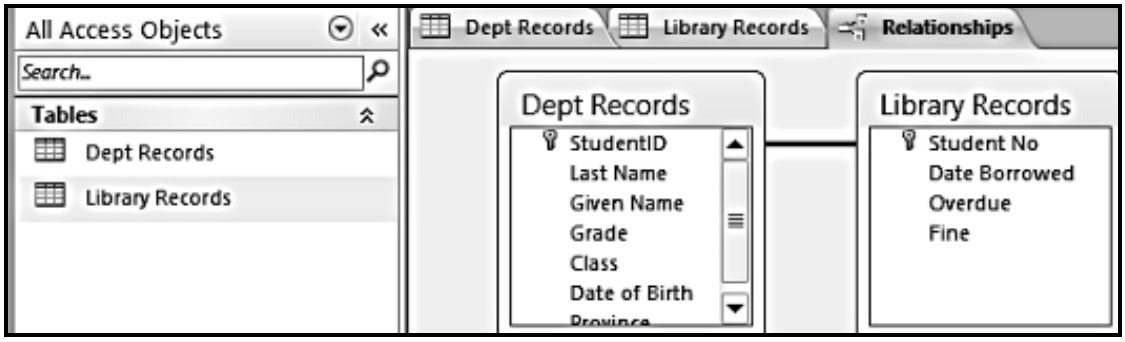
6. Link the two filenames.





After linking the **Library Records** in MS Excel to **Admin Records**

7. Creating a relationship between **Library Records** and **Dept Records.**



Your final answer after creating a relationship

11.5.4 Queries and Forms

11.5.4.1 Creating Select Queries

Queries are far more powerful than the simple searches or filters you might use to find data within a table. This is because queries can draw their information from **multiple** tables. For example, while you could use a **search** in the customers table to find the name of one customer at your business or a **filter** on the orders table to view only orders placed within the past week, neither would let you view both customers and orders at once. However, you could easily run a **query** to find the name and phone number of every customer who has made a purchase within the past week. A well-designed query can give information you might not be able to find out simply by examining the data in your tables.

When you run a query, the results are presented to you in a table, but when you design one, you use a different view. This is called **Query Design view**, and it allows you to see how your query is put together.

The importance of creating a query

1. View data only from the fields you are interested in viewing. When you open a table, you will see all the fields. A query is a handy way to save a selection of fields.

   A query only points to data, it does not store data. When you save a query, you are not saving a copy of the data.

2. Combine data from several data sources. A table usually only displays data that it stores. A query allows you to pick and choose fields from various sources, and specify how the information should be combined.

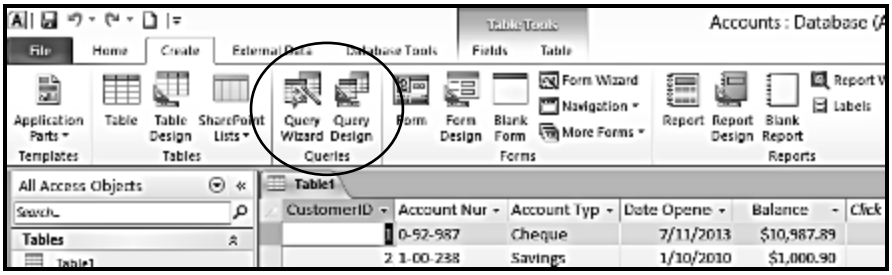
3. Use expressions as fields. For example, you could use the Date function as a field, or you could use the Format function with a field to control the way the data from the field is formatted in the query results.

4. View records that meet criteria that you specify. When you open a table, you will see all the records. A query is a handy way to save a selection of records.

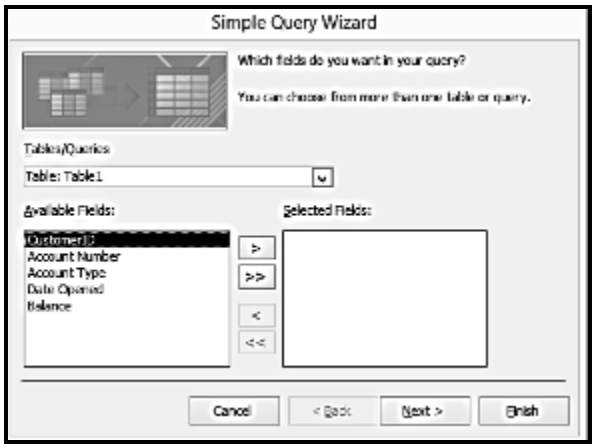
Basic steps to create a select query

You can use the Query Wizard to automatically create a select query. When you use the wizard, you have less control over the details of the query design, but, the query is usually created faster if you did not use the wizard. Moreover, the wizard can catch some simple design mistakes and prompt you to perform a different action. Some design elements are not available when you use the wizard. However, when you finish using the wizard, you can modify the query in Design view. Although, the two methods are somewhat different from each other, the basic steps are essentially the same: Follow the simple steps to create a select query.

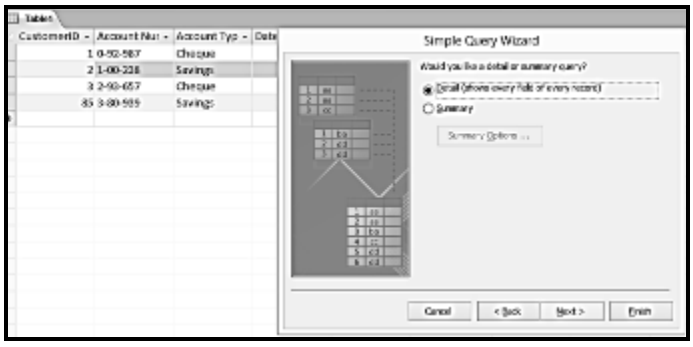
1. Open our database filename **Bank.** Choose the tables or queries that you want to use as sources of data.

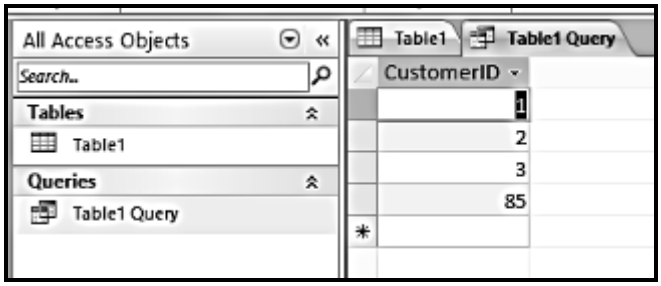


2. Specify the fields that you want to include from the data sources clicking **>** or **>>** to transfer to the selected fields. Choose **CustomerID**.



3. Click **Next** after choosing the specified fields.





After clicking finish for creating a select query

4. Optionally, specify criteria to limit the records that the query returns.

After you have created a select query, you may run it to see the results. To run a select query, you open it in Datasheet view. If you save the query, you can reuse it whenever you need it, for example, as a data source for a form, report, or another query.

Activity 11.5.4.1

Perform the activity below to test your understanding on creating queries.

What is the importance of creating queries?

1._____

_____

_____

_____

2._____

_____

_____

_____

3._____

_____

_____

_____

4._____

_____

_____

_____

5._____

_____

_____

_____

11.5.4.2 Controlling Queries Output

When you want to select specific data from one or more sources, you can use a select query. A select query helps you retrieve only the data that you want, and also helps you combine data from several data sources. You can use tables and other select queries as data sources for a select query. This topic provides an overview of select queries, and gives steps for creating a select query, by using the Query Wizard or in Design view.

When you want to use data, you rarely want to use all of the data from one table. For example, when you want to use data from a Contacts table, you usually want to look at one specific record, or maybe just the telephone number. Sometimes you want to combine data from more than one table, such as combining Customer information with Order information. To select the data that you want to use, you use a select query.

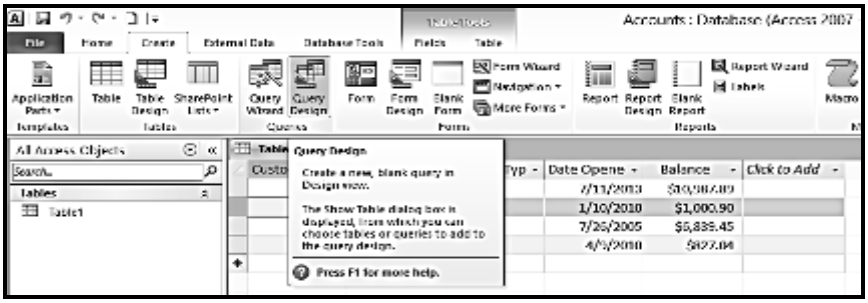
A select query is a database object that shows information in Datasheet view. A query does not store data, it displays data that is stored in tables. A query can show data from one or more tables, from other queries, or from a combination of the two.

A. Create a query by working in Design view

You can use Design view to manually create a select query. When you use Design view, you have more control over the details of the query design, but it is easier to make design mistakes, and it can take longer than using the wizard.

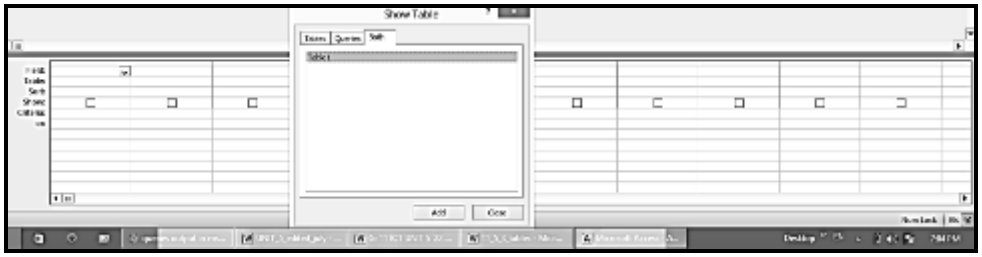
When you use Design view, because you use the **Show Table** dialogue box to add data sources, you add the data sources and fields in separate steps. Follow the steps on how to open or switch query to design view. Use our filename in database **Accounts.**

1. On the **Create** tab, in the **Other** group, click **Query Design**.



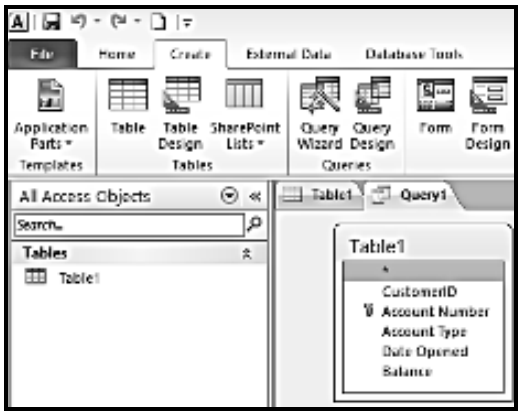
The Query design

2. In the **Show Table** dialogue box, on the **Both** tab, double-click each data source that you want to use.



The Show Table dialogue box

3. Close the **Show Table** dialogue box.

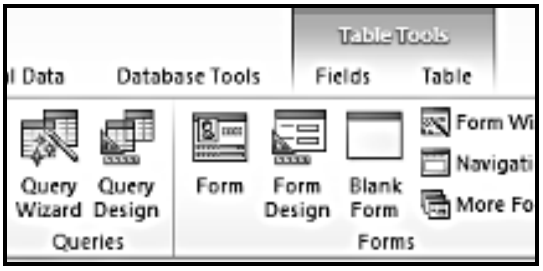


The Show table dialogue box

B. Sorting query output

Follow the steps below on how to sort query output.

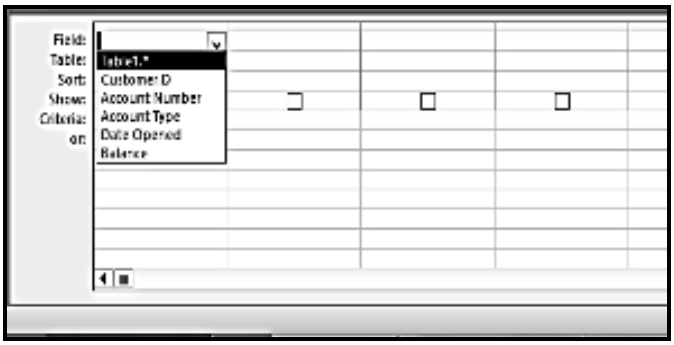
1. Open the query in Design view.



Query in Design view

2. Double-click the field that you want to use to sort.

   The field appears in the design grid.



The design grid to sort

3. In the design grid, clear the box in the **Show** row of the field that you added.
4. In the **Sort** row, specify whether you want to sort the field in ascending order (smallest values first; A-to-Z) or in descending order (largest values first; Z-to-A).

The Sort row

5. If you want to sort by more than one field, add additional sort fields by repeating steps 2 through 4.

   When you sort by more than one field, results are sorted initially by the first field that you specified, then by the next field that you specified, and so on. For example, if you sort by Last Name and then by Birthdate, all records with a Last Name value of Dow appear before records with a Last Name value of Stevens, regardless of the value of Birthdate. Records within each Last Name field are then sorted according to the value in the Birthdate field.

6. Press **CTRL+S** to save the query.

C. Filter the query output with criteria

Filtering is a useful way to see only the data that you want displayed. You can use filters to display specific records in a form, report, query, or datasheet, or to print only certain records from a report, table, or query. By applying a filter, you are able to limit the data in a view without altering the design of the underlying object. This lesson explains the types of filters in Access and how to apply, save or remove filters in an Access 2010 client database. The lesson does not apply to filtering records in an Access 2010 web database.

The importance of filters

Since the view you get after you apply a filter contains only records with the values that you selected, the rest of the data remains hidden until you clear the filter.

There are several types of filters and some of them are easy to apply and remove. Access 2010 contains some common filters that are built into every view. The availability of filter commands depends on the type and values of the field.

Activity 11.5.4.2

Perform the written activity to test your knowledge to create a query in Design view.

A. Write the steps on how to create a query in Design view

1._____

_____

2._____

_____

3._____

_____

B. Follow the steps below on how to create a Records Query.

1. Open our file **Students Profile**.
2. Create a records query for this file by using a Design View.
3. Click Create.
4. Click Add.
5. Double click Last Name.
6. CTRL + S to save the query.
7. Save it as **Department Query**.

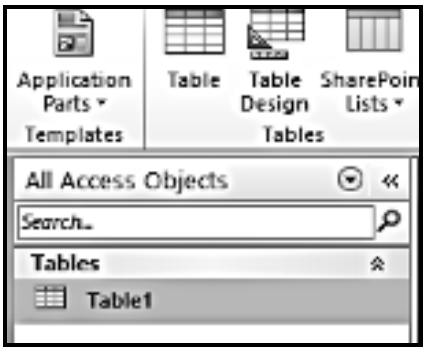
11.5.4.3 Creating Forms Effectively

Creating **forms** for your database can make entering data much more convenient. When you create a form, you can design it in a way that works with your database and makes sense to you.

Access makes it easy to create a **form** from any table in your database. Any form you create from a table will let you **view the data** that is already in that table and **add new data**. Once you've created a form, you can also modify it by adding additional fields and **design controls** such as combo boxes.

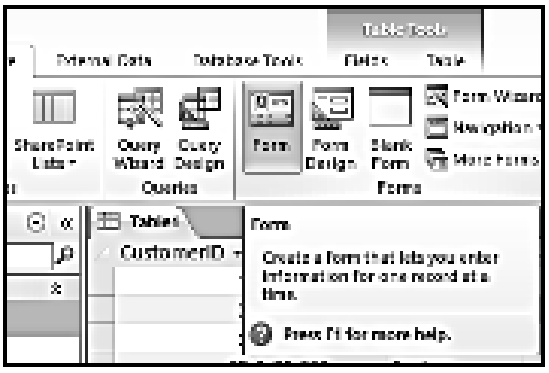
Follow the steps below on how to create a form:

1. In the **Navigation Pane**, **select** the table you would like to use to create a form. You do not need to open the table.



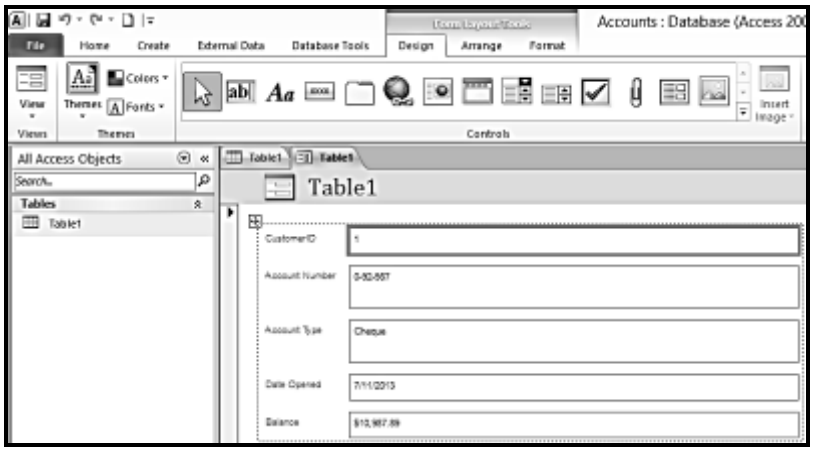
The navigation pane

2. Select the **Create** tab on the Ribbon, and locate the **Forms** group. Click the **Form** command.



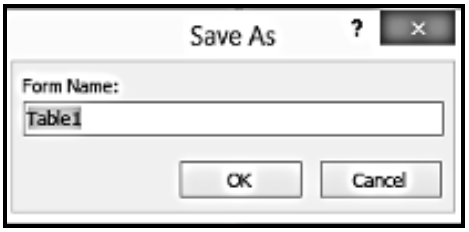
The Forms group

3. Your form will be created and opened in **Layout View**.



The Layout view

4. To **save** the form, click the **Save** command on the **Quick Access toolbar**.



The Save As command

5. Type **Accounts1** to save your work, and then click **OK.**

Saving Form

Aside from clicking the Save command from the Quick Access toolbar, there is another way for you to save your new form. Follow the steps in saving your form.

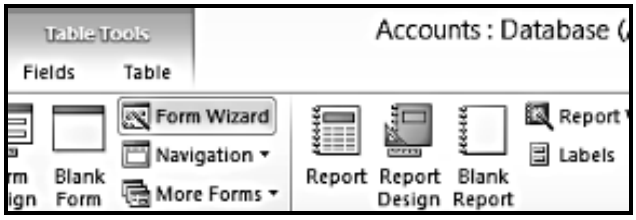
1. Place your mouse over the **Table1** form; double click the mouse and the **Save** command will appear.

The Save command

2. Type **Accounts1** to save your work, and then click **OK**.

Create a Form using the Wizard

Access provides several quick-create form tools on the **Create** tab, each of which lets you create a form with a single click. However, if you want to be more selective about what fields appear on the form, you can use the Form Wizard instead. The wizard also lets you define how the data is grouped and sorted, and you can use fields from more than one table or query (provided that you specified the relationships between the tables and queries beforehand). Follow the steps in creating Form Wizard.



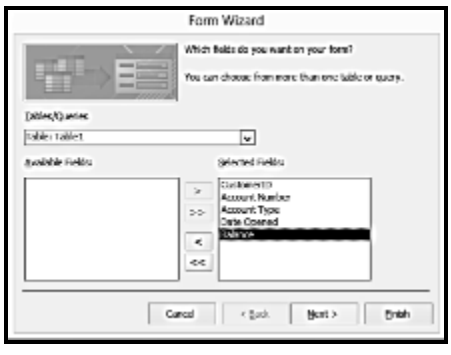
The Creat tab

1. On the **Create** tab, in the **Forms** group, and then click **Form Wizard**  .

2. Follow the directions on the pages of the Form Wizard.

The Form wizard

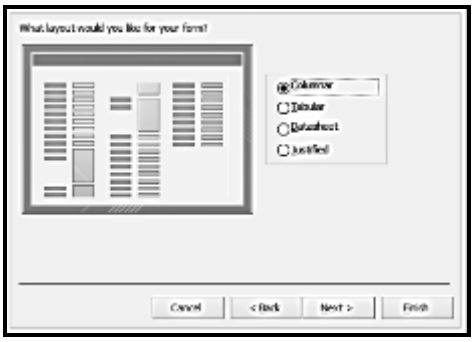
3. Select the field from the **Available Fields**, click either **>** for single entry field or **>>** for multiple entry field. Select multiple entry fields.



The Available field from the Form Wizard

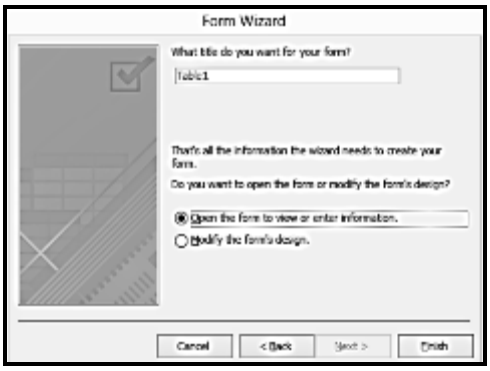
4. Choose from the Four Layout of the form.

5. Choose **Columnar** for the layout.

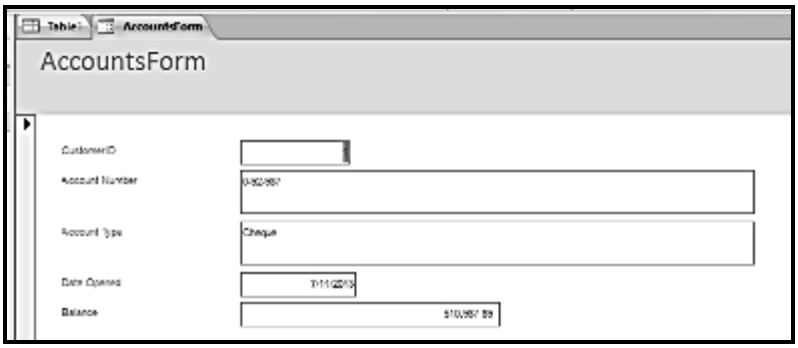


The Four layout

6. Type **AccountsForm** for the Title, click **Finish.**



To type the title in Form wizard



After creating Form Wizard

If you want to include fields from multiple tables and queries on the form, do not click **Next** or **Finish** after you select the fields from the first table or query on the first page of the Form Wizard. Instead, repeat the steps to select a table or query, and then click any additional fields that you want to include on the form. Then click **Next** or **Finish** to continue.

7. On the last page of the wizard, click **Finish**.

The Form Wizard can create a variety of results depending on the options that you select. As a result, we recommend that you run the wizard several times, experimenting with different options each time, until you get the results that you want.

Activity 11.5.4.3

Perform this written activity below to test your skills on creating a form using the Form wizard.

Write down the steps on how to create a form using the Form Wizard.

1._____

_____

2._____

_____

3._____

_____

4._____

_____

5._____

_____

6._____

_____

11.5.4.4 Customising Forms

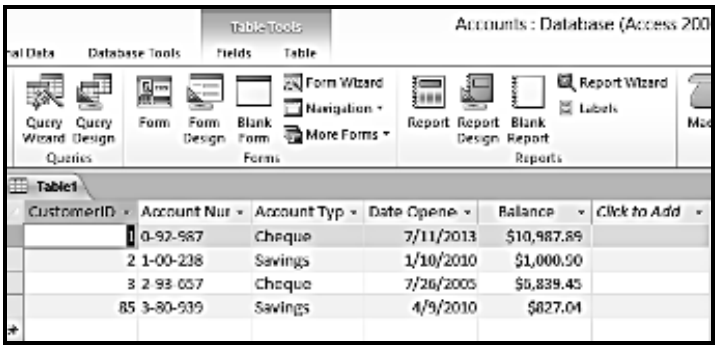
Since users have varying situations and needs when it comes to storing data, Microsoft equipped Access 2010 with capabilities that allow you to adjust specific settings for forms you want to create. Customising your forms can help make your database look consistent and professional. Some formatting changes can even make your forms easier to use. With Access 2010's formatting tools, you can customize your forms to look exactly the way you want. When you create a form, Access arranges the form components in a default layout where the fields are neatly stacked on top of each other, all exactly the same width. While this layout is functional, you might find that it does not fit your information in the best way.

A. To open form in design view

Access forms are much like paper forms: you can use them to enter, edit, or display data. They are based on tables. When using a form, you can choose the format, the arrangement, and which fields you want to display. Access will automatically create the Form, show it in *Form layout* view and assign the name of query used. You can also select *Form, Blank Form* or *Form Wizard* to create forms. Follow the steps on how to open form in design view.

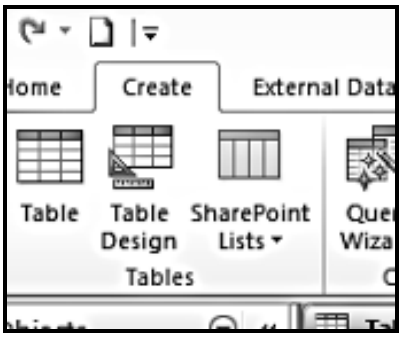
1. Open the Navigation pane.

2. Click the table or query on which you want to base your form. Let us open our database filename **Accounts.**



The filename Accounts in table form

3. Activate the **Create** tab.

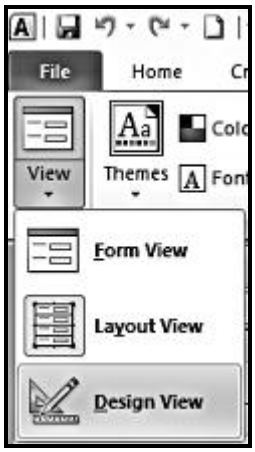


The Create tab

4. Click Form in the Forms group. Access creates a form.

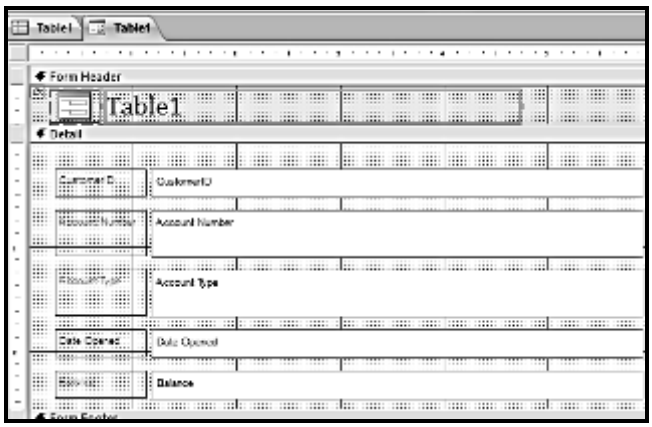
The Forms group

5. Click the View tab, and select and click Design view.



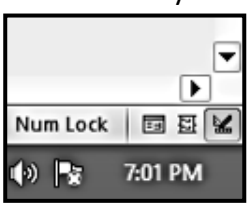
The Views tab

The Design view will appear in your database.



The Design View

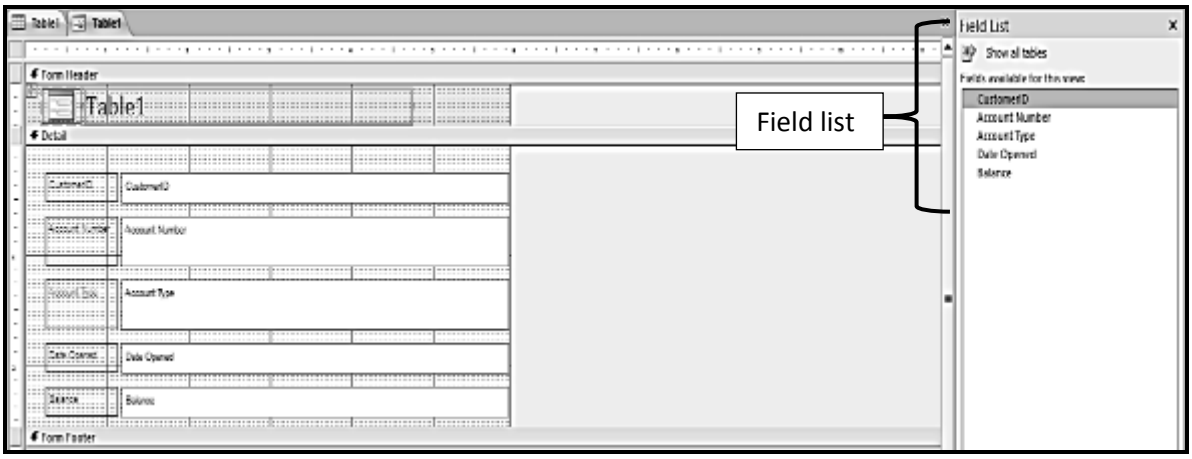
You can also check by looking on the right bottom of your database on what Views you are using, with the highlighted Views.



The Views on the right bottom of the database

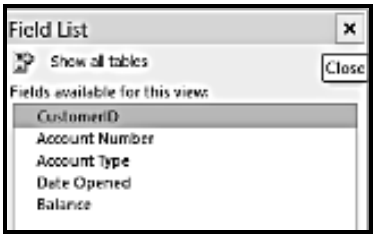
B. To show or hide field list

To show and to hide the field list after to open a form is very simple. Follow the steps on how to show or hide field list.



The Field list

1. Click **X** at the right corner of the Field list to hide it.

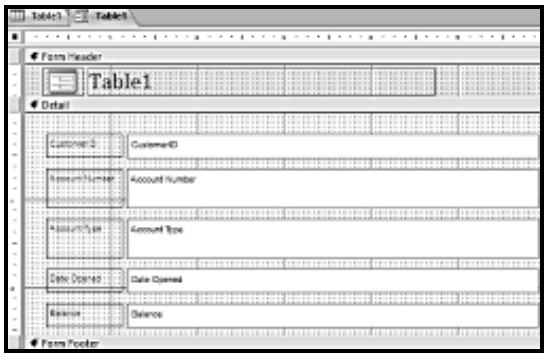


The Fieldlist

C. To show or hide toolbox

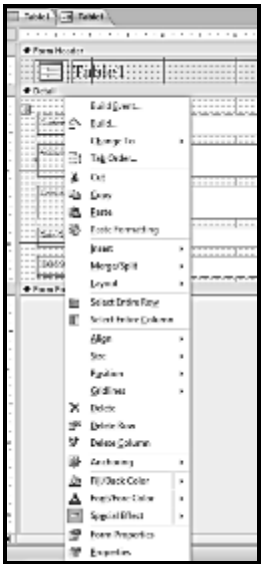
Using the Control Toolbox, you can add any of the controls you're used to working with: label, text, combo box, list box, check box, option button, toggle button, command button, and so on. If the Control Toolbox is not visible, follow the steps on how to show and hide the toolbox.

1. Position your mouse to the left part of the gray background of your database form.



The Control toolbox

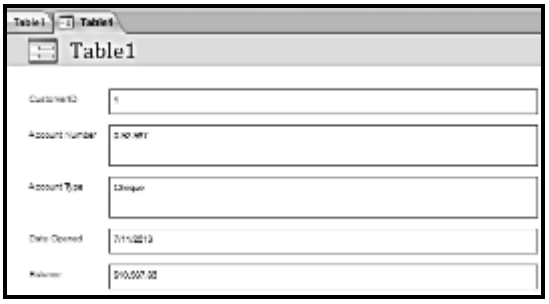
2. Right-click the form's gray background and check Control Toolbox. Then, drag and drop a control to the form and update the label text, if necessary.



The Control box

D. To resize control

When you create a form, Access arranges the form components in a default layout where the fields are neatly stacked on top of each other, all exactly the same width. While this layout is functional, you might find that it does not fit your information in the best way. For instance, in the form below, most of the fields are almost completely empty, since the data stored there does not take up much room.



The form would fit the data a little better if we made the fields and command buttons smaller, and if we put some of them side by side. However, with the default layout, you won't be able to put two fields next to each other or resize one field or button without resizing them all. This is because Access lines up form components in rows and columns. When you resize a field, you're really resizing the column that contains it.

To resize and rearrange our fields the way we want, we will have to **modify the form layout**. For instance, since the default layout for our form contains only two columns—one for the **field labels** and another for the **fields**—we would have to **create a new column** to put two fields side by side.

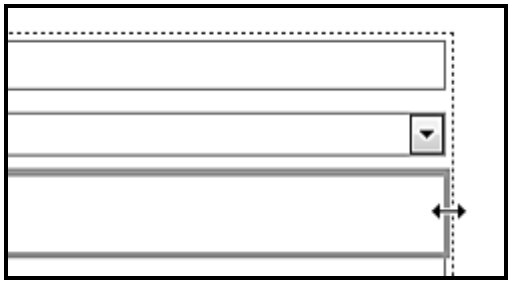
We can do this using the command on the **Arrange** tab, which contains all of the tools you need to customize your form's layout. If you've ever built and modified **tables** in Microsoft Word, you already know how to use most of these tools.

Follow the steps on how to resize form components:

1. Switch to **Layout** view.

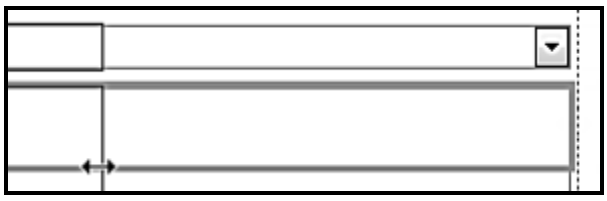
The View Group

2. Select the field or button you would like to resize, and **hover your mouse** over the edge. Your cursor will become a double-sided arrow ↔ .



Hover the mouse to resize the edge

3. **Click** and **drag** the edge to resize, and release when the field or button in the desired size.



To click and drag the edge to resize

4. The field or button, as well as every other item in line with it, will be resized.

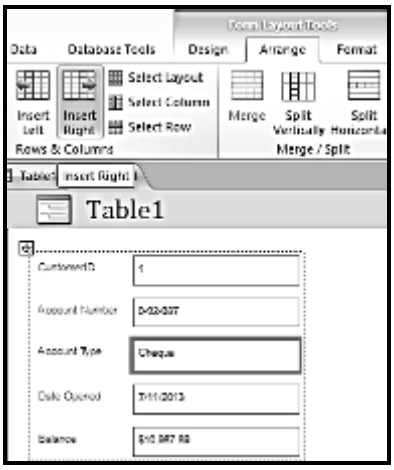
The resized field

E. To move both control and label

If necessary, **add columns or rows** to make room for the field or button you wish to move by using the **Insert** commands in the **Rows & Columns** group. Suppose we want to move the **Balance** field to the right of the **Customer ID** field, so we will have to create two new columns to the right: one for the field label, and one for the field itself. To do this, follow the steps to move both control and label.

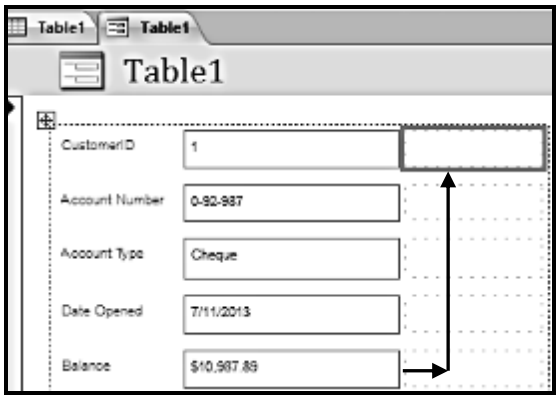
1. From **Layout** view, choose Arrange tab.

2. Click the **Insert Right** command twice.



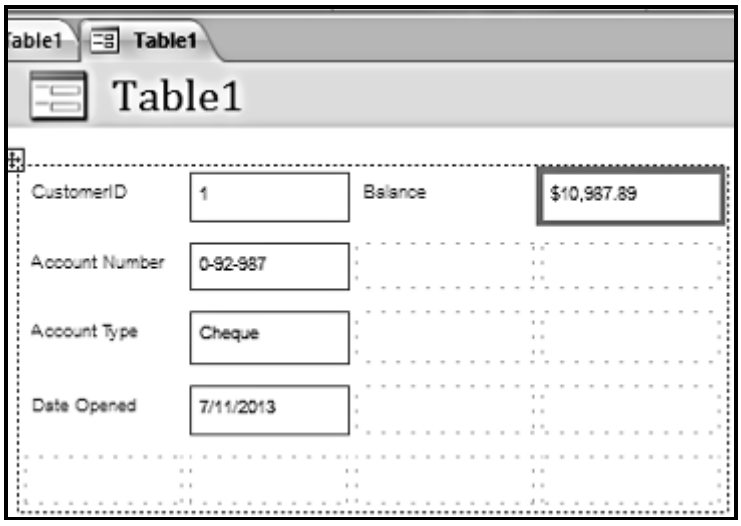
To arrange tab

3. **Click** and **drag** the field or button to its new location. If you are moving a field, make sure to move the **field label** as well.



To move the field label

4. **Repeat** steps **one and two** with any other fields or buttons you wish to move.



To move the field label any other fields

Activity 11.5.4.4

Perform the Activity to test your skills in using Customising Forms in Access.

A. Write the steps on how to open form in design view.

1._____

2._____

3._____

4. _____

5._____

B. Write down the steps on how to resize form components

1._____

2._____

3._____

4. _____

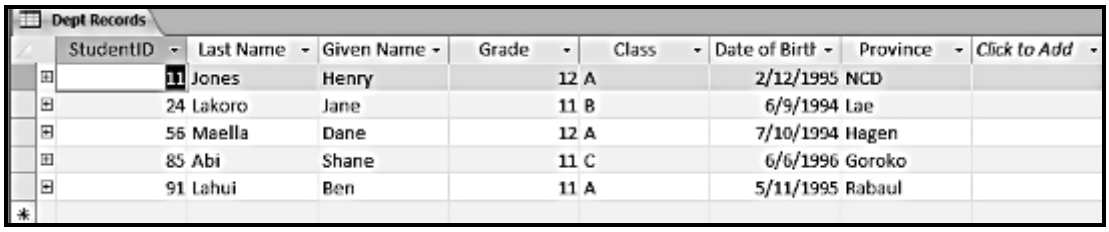
11.5.4.5 Creating Useful Reports

Creating Reports

Reports organise and summarise data for viewing online or for printing. A detail report displays all of the selected records. You can include summary data such as totals, counts, and percentages in a detail report. A summary report does not list the selected records but instead summarises the data and presents totals, counts, percentages, or other summary data only. Access has several report generation tools that you can use to create both detail and summary reports quickly. This lesson teaches you how to create reports. Reports allow you to organize and present your data in a reader-friendly, visually appealing format. Access 2010 makes it easy to create and customize a report using data from any query or table in your database. Follow the steps on how to create a report.

To create a report

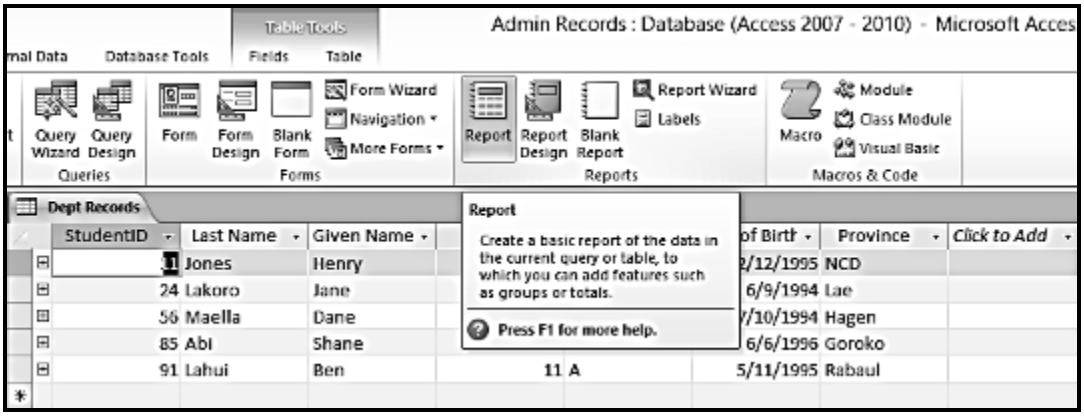
1. Open the table or query to use in your report. We want to print it out so we will open up our **Dept Records Query**. That you have created on page 116.



The Query for DeptRecords

2. Select the **Create** tab on the Ribbon, and locate the **Reports** group.

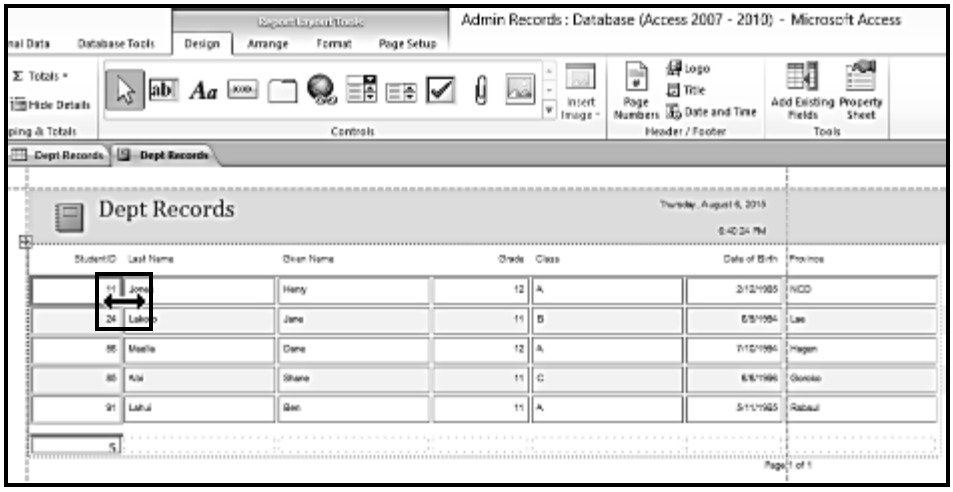
   Click the **Report** command.



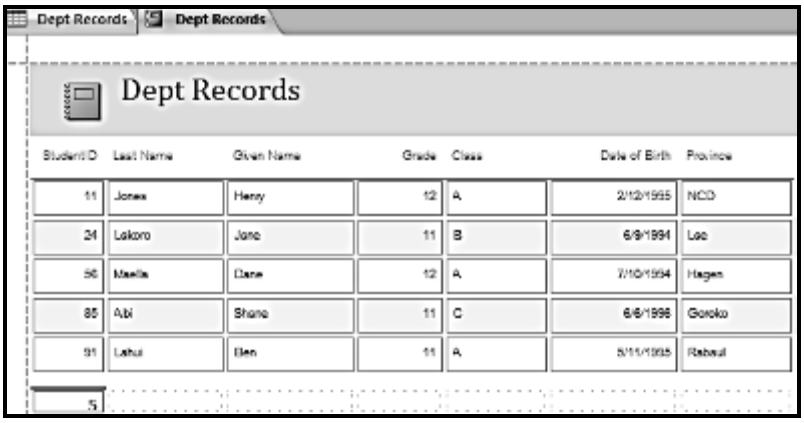
The reports

3. Access will create a new report based on your object.

4. It is likely that some of your data will be located on the other side of the **page break**. To fix this, **resize** your fields. Simply select a field, then **click** and **drag** its edge until the field is the desired size. **Repeat** with additional fields until all of your fields fit.



The DeptRecords



After adjusting the fields

5. To **save** your report, click the **Save** command on the **Quick Access toolbar**. When prompted, type a **name** for your report, and then click **OK**.

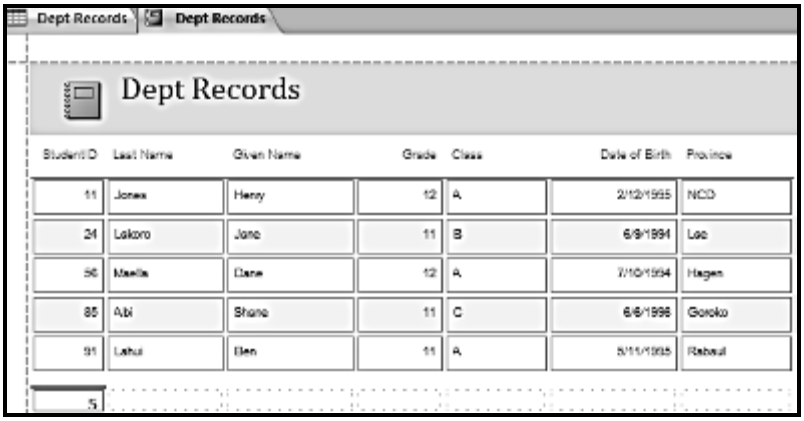
To Save the report

Just like tables and queries, reports can be **sorted** and **filtered**. Simply **right-click** the field you wish to sort or filter. Then select the desired sorting or filtering option.

Print Access data by creating Mail Merge Wizard in Microsoft Word

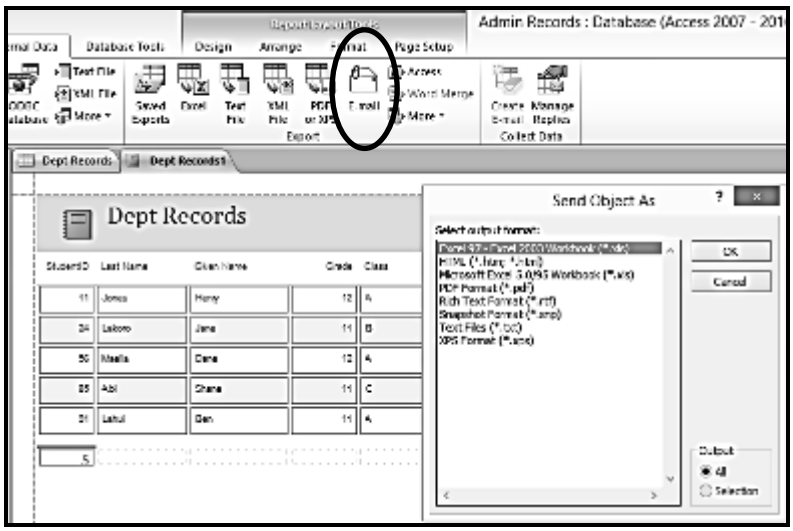
If your addresses are stored in Access, but you want to export them to Word so that you can use its mail merge functionality to format and print your labels, you can use the Mail Merge Wizard in Word. Follow the steps in creating mailing labels.

1. Let us again use the **Dept Records,** in the Navigation Pane, select the table or query that contains the data you want to print.



DeptRecords to print

2. On the **External Data** tab, in the **Export** group, click **E-mail.**



From the Export group, click E-mail

3. In the **E-mail Mail Merge Wizard** dialogue box, if you have already created a document and you want to link your data to it, choose from the given dialogue box on where will you crate your mailing labels.

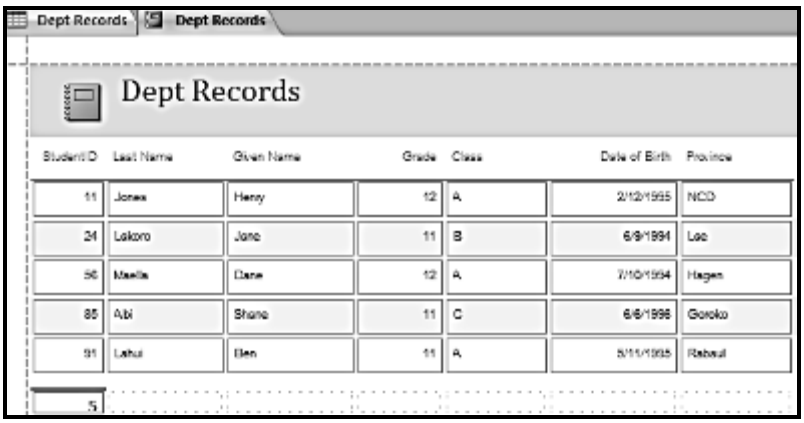
4. Click **OK**.

If you chose **Text Files (*.This is an example of simple text.)**, the **Select Microsoft Word Document** dialogue box opens. Select the document you want, and click **Open**. The document will be opened in Word.

Create labels by using the Label Wizard in Access

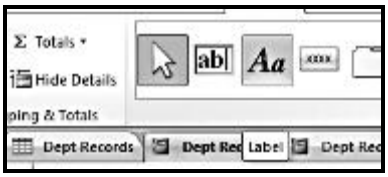
Label reports that you create by using the Label Wizard are not compatible with the Publish to Access Services feature. However, you can still print the labels when you have the database open in the Access program.

1. In the Navigation Pane, select the object that contains the data you want to display on your labels. This is usually a table, a linked table, or a query, but you can also select a form or report.



Data that contains to display your label

2. On the **Create** tab, in the **Reports** group, click **Labels**.



Access starts the Label Wizard

Use Access to create and print labels

In Access, you create labels as a report that is formatted with a small page size to fit the desired label. The most common use of labels is for mailing, but any Access data can be printed in a label format for a variety of purposes. In the case of mailing labels, the report gets the address data from the tables or queries containing the addresses. Printing the report gives you a single label for each address from the underlying record source.

Set print options

While you can print your data from a table, query, from or report in your Microsoft Access database, you can set print options for reports that will produce an eye-catching and more readable printed copy of your data.

Printing data directly from tables or queries works when you want to print just a simple list. Forms are better suited for viewing or printing data for a single record or related set of records, and not for printing larger sets of data from a report, you can compare, summarize, and total large sets of data, and then present that information in an attractive layout. Follow the steps on how to set page margins.

Set page margins

Follow the steps below on how to set page margins.

1. Let us again use our database file **Admin Records,** in the Navigation Pane, right click the report and then click **Print Preview.**

2. On the **Print Preview** tab, in the **Page Layout** group, click **Page Setup** and set the margins, orientation and column settings that you want.

The Page Set up menu

3. Let us change the left margin into 0.50 and the right margin to 0.50.

4. Click **OK**.

The Page setup menu, margins

To change the Page Orientation

This is to select the **Portrait** or **Landscape** orientation. If you want to see the report appears, instead of setting the orientation here set it from the Page Preview tab. Follow the steps on how to change the Page Orientation.

1. Let us use again our database file **Admin Records,** in the Navigation Pane, right click the report and then click **Print Preview.**

2. On the **Print Preview** tab, in the **Page Layout** group, click **Page** and set Page Orientation.

The Page Setup menu

3. On the **Print Preview** tab, in the **Page Layout group**, click **Portrait** or **Landscape**.

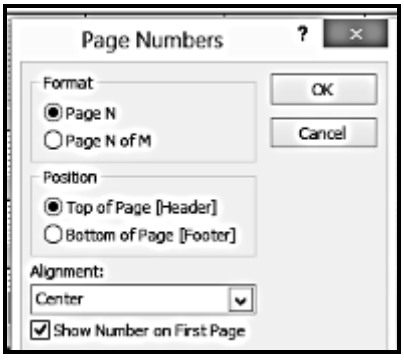
4. Select **Landscape** for our report.

To set number pages

To insert page number in your report is also essential especially if you have multiple pages to print. Follow the steps on how to set page numbers.

1. Let us use our database file again **Admin Records**, click the **Navigation Pane**, right- click the form and click **Design view**.

2. On the **Design tab**, in the **Controls** group, click **Page Numbers.** The Page Numbers dialogue box appears.



The Page Numbers in Control group

3. Choose the **format**, **position**, and **alignment** that you want for the page numbers.

4. Clear the **Show Number on First Page** check box if you do not want a number on the first page.

5. Click **OK.**

Activity 11.5.4.5

Perform the activity below to test your ability to create useful reports.

A. What is the difference of Reports from Tables and Forms?

_____

_____

_____

_____

B. Write the steps on how to number pages.

1. _____

2. _____

3. _____

4. _____

5. _____

Summative Activities 11.5.4

A. Create a Query Wizard for Customer ID.

1. Let us create our database filename **Customer ID**

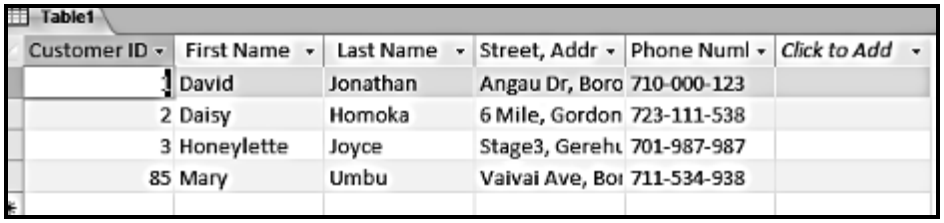
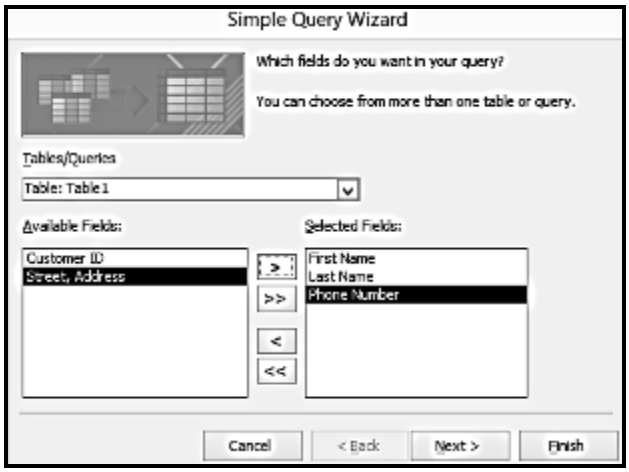


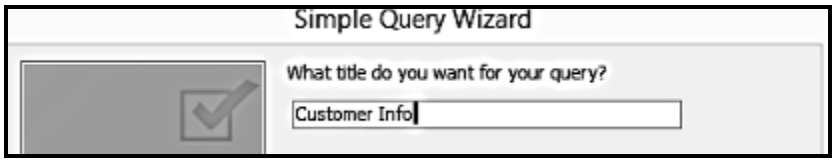
Table1

Customer ID	First Name	Last Name	Street, Addr	Phone Numl	Click to Add
1	David	Jonathan	Angau Dr, Boro	710-000-123	
2	Daisy	Homoka	6 Mile, Gordon	723-111-538	
3	Honeylette	Joyce	Stage3, Gerehu	701-987-987	
85	Mary	Umbu	Vaivai Ave, Bor	711-534-938	

2. Choose First Name, Last Name, and Phone Number.



3. Name the title for this query as **Customer Info.**



Create the outcome for Query Wizard.

B. To create Forms

After creating Query, create Forms from your final answer from **Activity A** above.

C. To create Reports

We will also use our database from **Customer ID** to create a Report.

1. Use **Table 1** and **Customer Info** to create your Report, check your answers at the end of this activities.

Answers to Learning Activities

Activity 11.5.4.1
The importance of creating a query

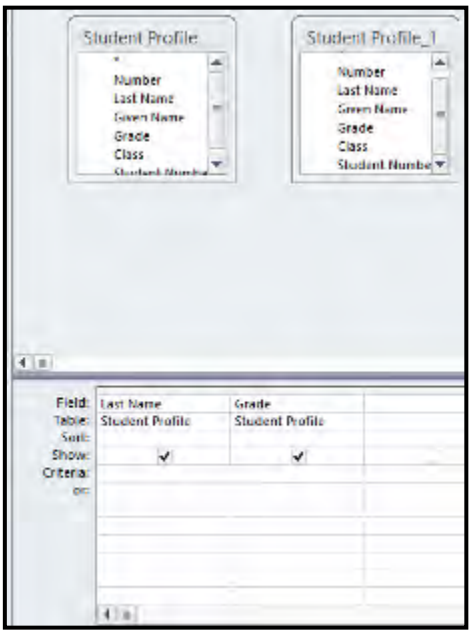
1. View data only from the fields you are interested in viewing. When you open a table, you will see all the fields. A query is a handy way to save a selection of fields.
2. A query only points to data, it does not store data. When you save a query, you are not saving a copy of the data.
3. Combine data from several data sources. A table usually only displays data that it stores. A query allows you to pick and choose fields from various sources, and specify how the information should be combined.
4. Use expressions as fields. For example, you could use the Date function as a field, or you could use the Format function with a field to control the way the data from the field is formatted in the query results.
5. View records that meet criteria that you specify. When you open a table, you will see all the records. A query is a handy way to save a selection of records.

Activity 11.5.4.2

A.

1. On the **Create** tab, in the **Other** group, click **Query Design**.
2. In the **Show Table** dialogue box, on the **Both** tab, double-click each data source that you want to use.
3. Close the **Show Table** dialogue box.

B.



Activity 11.5.4.3

1. On the **Create** tab, in the **Forms** group, and then click **Form Wizard**.
2. Follow the directions on the pages of the Form Wizard.
3. Select the field from the **Available Fields**, click either **>** for single entry field or **>>** for multiple entry field. Select multiple entry fields.
4. Choose from the Four Layout of the form.
5. Type **AccountsForm** for the Title, click **Finish.**
6. On the last page of the wizard, click **Finish**.

Activity 11.5.4.4

A. To open form in design view

1. Open the Navigation pane.
2. Click the table or query on which you want to base your form. Let us open our database filename **Accounts.**
3. Activate the Create tab.
4. Click Form in the Forms group. Access creates a form.
5. Click the View tab, and select and click Design view.

B. To resize form components:

1. Switch to **Layout** view.
2. Select the field or button you would like to resize, and **hover your mouse** over the edge. Your cursor will become a double-sided arrow ⟷ .
3. **Click** and **drag** the edge to resize, and release when the field or button is the desired size.
4. The field or button, as well as every other item in line with it, will be resized.

Activity11.5.4.5

A.

Reports organise and summarise data for viewing online or for printing. A detail report displays all of the selected records. You can include summary data such as totals, counts, and percentages in a detail report. A summary report does not list the selected records but instead summarises the data and presents totals, counts, percentages, or other summary data only.

B.

1. Click the **Navigation Pane**, right- click the form and click **Design view**.
2. On the **Design tab**, in the **Controls** group, click **Page Numbers.** The Page Numbers dialogue box appears.
3. Choose the **format**, **position**, and **alignment** that you want for the page numbers.
4. Clear the **Show Number on First Page** check box if you do not want a number on the first page.
5. Click **OK.**

Answers to Summative Activity 11.5.4

Answer A.

Table1 | Customer Info

First Name	Last Name	Phone Numl
David	Jonathan	710-000-123
Daisy	Homoka	723-111-538
Honeylette	Joyce	701-987-987
Mary	Umbu	711-534-938

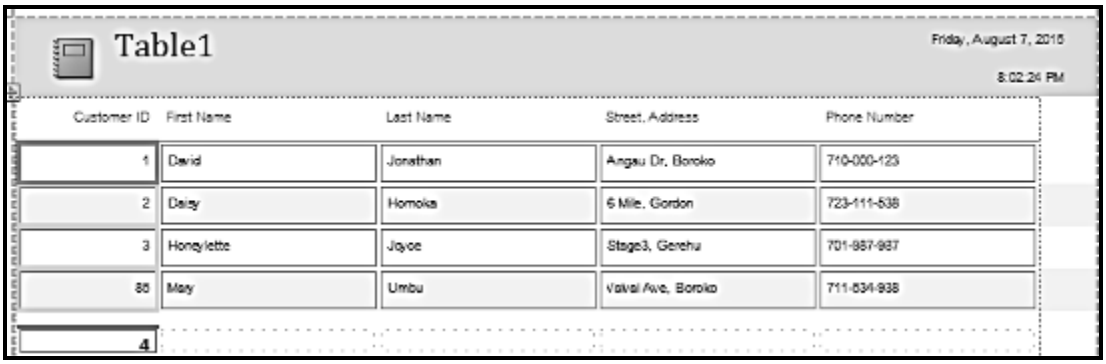
Query

Answer B

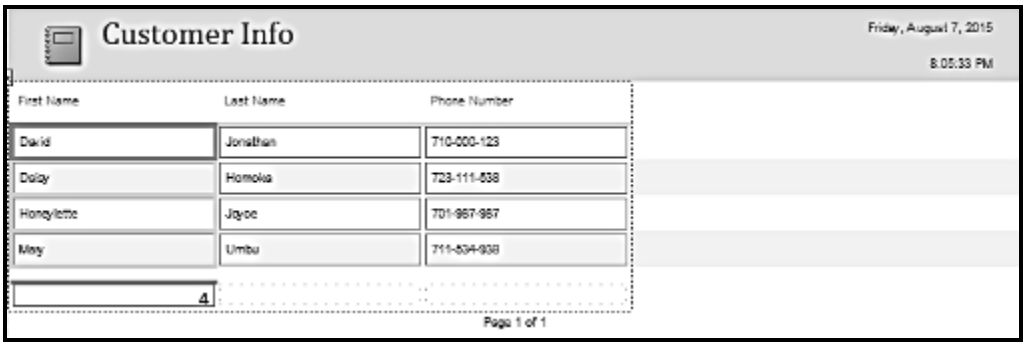
Forms

Answer to C
Reports

Table 1



Customer Info



Summary

Database

In computing, databases are sometimes classified according to their organisational approach. The most preferred approach is the relational database, a tabular database in which data is defined so that it can be reorganised and accessed in a number of different ways. A distributed database is one that can be dispersed or replicated among different points in a network. An object-oriented programming database is one that is congruent with the data defined in object classes and subclasses.

Traditional databases are organised by *fields*, *records*, and *files*. A field is a single piece of information; a record is one complete set of fields; and a file is a collection of records

MS Access 2010

All Microsoft Office 2010 programs share a common user interface so you can apply basic techniques that you learn in one program to other program. The Access 2010 is a database application design and deployment tool that you can use to keep track of important information. You can keep your data on your computer, or you can publish on the Web — so others can use your database with a web browser.

Many people start using Access when the program that they are using to keep track of something gradually becomes less fit for the task. Like any other computer application, in order to use Microsoft Access, you must first install it.

The three main components of the Access 2010 user interface are:

- **The ribbon** is the strip of tabs across the top of the program window that contains groups of commands. It is designed to help you quickly find the commands that you need to complete a task. The main tabs are visible at all times.

- **The Backstage view** is the collection of commands that you see on the **File** tab on the ribbon. It is used to display the Backstage View which contains all the commands related to managing files and customizing the program. It provides an easy way to create, save, print, open, and close files; find recently used files; view and update file properties; set permission; set program options; get help; and exit the program. You can display the Backstage view at any time by clicking the File tab on the Ribbon.

- **The Navigation Pane** is the pane on the left side of the Access program window that lets you work with database objects. The Navigation Pane replaced the Database Window in Access 2007. It is a central location from which you can easily view and access all your database objects. By default, it appears along the left side of the program window and displays all the all the objects in the database, grouped by object type and sorted by object name.

Database Objects

An Access database can contain six types of objects: *tables, queries, forms, reports, macros, and modules.* Database objects are created to input, edit, retrieve, display, or print data. The names of all the database objects are displayed in the Navigation pane.

Designing Database

The most basic object in a database is a table in which you store your data. The following guidelines will help you create efficient table.

- **One table per subject**: The first rule in creating database tables is to ensure that every table stores data about one subject.
- **Give every table a primary key**: Another important consideration in creating a table is to assign a primary key. This field contains a value that sets a record apart from all other records in the table.
- **Include foreign keys**: a final thing you can do to make your tables more efficient is to include foreign keys. A primary key from one table is called a foreign key. You use foreign keys to create relationships between tables.

Defining Fields

Every table is made up of fields. Each field has a set of properties that control the way it stores, handles and displays data (example: field size, format, input mask, default value). A field's data type is the most important property because it determines what kind of data the field can store. The field's description indicates the field's purpose and is optional. The field's data type determines which other properties you can set. Access automatically assigns default field properties which you can modify as needed.

Primary Key

A *primary key* consists of one or more fields that uniquely identify each record in the table. There are several advantages to setting a *primary key.* The primary key is automatically indexed, which make information retrieval faster. When you open a table, the records are automatically sorted in order of the primary key. It prevents the entry of duplicate data.

References

Access 2010, Database tasks. http://www.office.com/redir/FX010048757. 07 February 2015

Create a Database from Scratch. http://www.office.com/redir/. 07 February 2015

Import an Excel worksheet as a Table in a new Database. http://www.office.com/en-US/Article/Access-2010-database-tasks-268acfed-2484-4822-acb3. 07 February 2015

Relational database . http://searchsqlserver.techtarget.com/definition/relational-database. 07 February 2015

Relational database and Database definition. http://www.businessdictionary.com/definition/database.html#ixzz30kzz9DL. 07 February 2015

Creating a project. http://www.my-project-management-expert.com/creating-a-project-plan.html. 07 February 2015

Type of database. http://www.my-project-management-expert.com/type-of-database.html. 07 February 2015

Purpose of database System. http://ecomputernotes.com/fundamental/disk-operating-system/what-is-operating-system. 07 February 2015

A timeline of Database history. http://avant.org/. 07 February 2015

A brief history of database. Http://www.ruralsignage.com/schoolfiles/historyofcomtech/history-commTech.html. 07 February 2015

A brief history of database. http://en.wikipedia.org/wiki/history. 07 February 2015

History of Database. http://www.flicker.com/photos/mwichary/2372387591/sizes/l/. by Marcin Wichary. 07 February 2015

File System. http://dl.acm.org/citation.cfm?id=1458058. 07 February 2015

Database Management Systems. http://cultureandcommunication.org/deadmedia/index.php/file:dd53.jpg. 07 February 2015

Relational database. http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/re/db/. 07 February 2015

Functions of a database in an application. http://now.ehow/tech?utm_source=ehow&utm_medium=intex&utm_term=database+software&utm_content=intext-dh018utm_campaign=none&article_title=what+are+functions+a+database+in-an-application?. 07 February 2015

Components of Database Management System Software. http://yurarticlelibrary.com/wp-content/uploads/2013/12/b834.jpg. 07 February 2015

Create a blank database. http://database.about.com/od/specificproducts/a/whatisdatabase.htm. 07 February 2015

Getting started with Microsoft Office Access. http://support.office.com/en-us/article/create-a-new-database. 07 February 2015

Template. http://databases.about.com/od/accessdatabasetemplates/microsoft_access_database_templates.htm. 07 February 2015

Access 2010. http://www.gcflearnfree.org/access2010. 07 February 2015

Microsoft Access. Step by Step Guide by Mark Nicholls, ICT Lounge.

California State University, Los Angeles

Information Technology Services, ITS, Fall 2014, Ver. 1.2, Microsoft Access 2010, Introduction to Access. http://www.calstaleta.cdu. 07 February 2015

Microsoft 2013 Step by Step by Joyce Cox & Joan Lambert, Copyright 2013

Glossary

Absolute or fixed positioning
Places the element relative to either the element's parent or, if there is not one, the body. Values for the element's Left and Top properties are relative to the upper-left corner of the element's parent.

Access workspace
A workspace that uses the Access database engine to access a data source. The data source can be an Access database file, an ODBC database, such as a Paradox or Microsoft SQL Server database, or an ISAM database.

Action
The basic building block of a macro; a self-contained instruction that can be combined with other actions to automate tasks. This is sometimes called a command in other macro languages.

Action argument
Additional information required by some macro actions. For example, the object affected by the action or special conditions under which the action is carried out.

Action list
The list that appears when you click the arrow in the Action column of the Macro object tab.

Action query
A query that copies or changes data. Action queries include append, delete, make-table, and update queries. They are identified by an exclamation point (!) next to their names in the Navigation Pane.

Action row
A row in the upper part of the Macro object tab in which you enter macro names, actions, arguments, and comments associated with a particular macro or macro group.

Advanced Filter/Sort window
A window in which you can create a filter from scratch. You enter criteria expressions in the filter design grid to restrict the records in the open form or datasheet to a subset of records that meet the criteria.

Aggregate function
A function, such as Sum, Count, Avg, or Var, that you use to calculate totals.

Append query
An action query that adds the records in a query's result set to the end of an existing table.

Application background
The background area of an application window.

ASCII
American Standard Code for Information Interchange (ASCII) 7-bit character set used to represent letters and symbols found on a standard U.S. keyboard.

Autofiltering
Filtering data in PivotTable or PivotChart view by selecting one or more items in a field that allows filtering.

Autoformat
A collection of formats that determines the appearance of the controls and sections in a form or report.

Automatic link
A link from an OLE object in Access to an OLE server that automatically updates the object in Access when the information in the object file changes.

AutoNumber data type
In an Access database, a field data type that automatically stores a unique number for each record as it is added to a table. Three kinds of numbers can be generated: sequential, random, and Replication ID.

Bound hyperlink control
A control that is used on a data access page to bind a link, an intranet address, or an Internet address to an underlying Text field. You can click the hyperlink to go to the target location.

Bound object frame
A control on a form or report that is used to display and manipulate OLE objects that are stored in tables.

Bound picture
A control that is used on a form, report, or data access page to bind an image to an OLE Object field in an Access database or an image column in an Access project.

Calculated control
A control that is used on a form, report, or data access page to display the result of an expression. The result is recalculated each time there is a change in any of the values on which the expression is based.

Calculated field
A field, defined in a query, that displays the result of an expression rather than displaying stored data. The value is recalculated each time a value in the expression changes.

Call tree
All modules that might be called by any procedure in the module in which code is currently running.

Caption section
The section on a grouped data access page that displays captions for columns of data. It appears immediately before the group header. You cannot add a bound control to a caption section.

Category field
A field that is displayed in the category area of PivotChart view. Items in a category field appear as labels on the category axis.

Channel number
An integer that corresponds to an open Dynamic Data Exchange (DDE) channel. Channel numbers are assigned by Microsoft Windows 95 or later, created by using the DDEInitiate function, and used by other DDE functions and statements.

Character data type
In an Access project, a fixed-length data type with a maximum of 8,000 ANSI characters.

Character code
A number that represents a particular character in a set, such as the ANSI character set.

Chart
A graphical representation of data in a form, report, or data access page.

Check box
A control that indicates whether an option is selected. A check mark appears in the box when the option is selected.

Column
A location within a database table that stores a particular type of data. It is also the visual representation of a field in a datasheet and, in an Access database, the query design grid or the filter design grid.

Column area
The part of PivotTable view that contains column fields.

Column field
A field in the column area of PivotTable view. Items in column fields are listed across the top of a PivotTable list. Inner column fields are closest to the detail area; outer column fields are displayed above the inner column fields.

Column selector
The horizontal bar at the top of a column. You can click a column selector to select an entire column in the query design grid or the filter design grid.

Command button
A control that runs a macro, calls a Visual Basic function, or runs an event procedure. A command button is sometimes called a push button in other programs.

Comparison operator
An operator that is used to compare two values or expressions. For example, < (less than), > (greater than), and = (equal to).

Compound control
A control and an attached label, such as a text box with an attached label.

Conditional filtering
Filtering a field to show the top or bottom n items based on a total. For example, you could filter for the three cities that generated the most sales or the five products that are least profitable.

Conditional formatting
Formatting the contents of a control in a form or report based on one or more conditions. A condition can reference another control, the control with the focus, or a user-defined Visual Basic for Applications function.

Connection string
A string expression that is used to open an external database.

Constraint
A restriction placed on the value that can be entered into a column or a row. For example, values in the Age column cannot be less than 0 or greater than 110.

Continuous form
A form that displays more than one record on the screen in Form view.

Control containing a hyperlink
A control that makes it possible for a user to jump to a document, Web page, or object. An example is a text box that is bound to a field that contains hyperlinks.

Crosstab query
A query that calculates a sum, average, count, or other type of total on records, and then groups the result by two types of information: one down the left side of the datasheet and the other across the top.

Currency data type
In an Access database, a data type that is useful for calculations involving money or for fixed-point calculations in which accuracy is extremely important.

Cursor data type
In an Access project, a data type you can use only for creating a cursor variable. This data type cannot be used for columns in a table. A cursor is a mechanism used to work with one row at a time in the result set of a SELECT statement.

Custom group
An item of a custom group field. A custom group contains two or more items from a row or column field.

Custom group field
A field in the row or column area that contains custom groups as its items.

Custom order
User-defined sort order. For example, you could define a custom sort order to display values in the Employee Title column on the basis of the title's seniority.

Custom properties dialog box
A custom property sheet that allows users to set properties for an ActiveX control.

Data access objects
A programming interface that you can use to access and manipulate database objects.

Data access page
A Web page designed for viewing and working with data from the Internet or an intranet. Its data is typically stored in an Access database.

Data access page properties
Attributes of a data access page that identify the database to which the page is connected and define the page's appearance and behaviour.

Data area
The part of PivotTable or PivotChart view that contains summary data. Values in the data area are displayed as records in PivotTable view and as data points in PivotChart view.

Data collection
A method of gathering information from users by sending and receiving HTML forms. In Access, you create a data collection request and send it to users in a form contained in an e-mail message. Users then complete a form and return it to you.

Data definition
The fields in underlying tables and queries, and the expressions, that make up the record source for a data access page.

Data definition language (DDL)

The language used to describe attributes of a database, especially tables, fields, indexes, and storage strategy. ANSI defines this to have the tokens CREATE, DROP, and ALTER. DDL is a subset of structured query language (SQL).

Data definition query
An SQL-specific query that can create, alter, or delete a table, or create or delete an index in a database. ANSI defines these as DDL queries and uses the tokens CREATE, DROP, and ALTER.

Data field
A field that contains summarized data in PivotTable or PivotChart view. A data field usually contains numeric data.

Data item
An application-specific piece of data that can be transferred over a (Dynamic Data Exchange) DDE channel.

Data label
A label that provides additional information about a data marker, which represents a single data point or value.

Data manipulation language (DML)
The language used to retrieve, insert, delete and update data in a database. DML is a subset of Structured Query Language (SQL).

Data marker
A bar, area, dot, slice, or other symbol in a chart that represents a single data point or value. Related data markers in a chart constitute a data series.

Data series
Related data points that are plotted in a chart. Each data series in a chart has a unique colour or pattern. You can plot one or more data series in a chart.

Data source control
The engine behind data access pages and Microsoft Office Web Components that manages the connection to the underlying data source. The data source control has no visual representation.

Database application
A set of objects that can include tables, queries, forms, reports, macros, and code modules that are designed to work together to make a database easier to use. A database application is typically deployed to a group of users.

Database diagram
A graphical representation of any portion of a database schema. It can be either a whole or partial picture of the structure of the database. It includes tables, the columns they contain, and the relationships between the tables.

Database Documenter
A tool that builds a report containing detailed information about the objects in a database.

Database objects
An Access database contains objects such as tables, queries, forms, reports, pages, macros, and modules. An Access project contains objects such as forms, reports, pages, macros, and modules.

Database replication
The process of creating two or more special copies (replicas) of an Access database. Replicas can be synchronized, changes made to data in one replica, or design changes made in the Design Master, are sent to other replicas.

Database window
The window that appears when you open an Access database or an Access project. It displays shortcuts for creating new database objects and opening existing objects. In Access 2010, the Database window is replaced by the Navigation Pane.

Data-definition query
An SQL-specific query that contains data definition language (DDL) statements. These statements allow you to create or alter objects in the database.

Datasheet
Data from a table, form, query, view, or stored procedure that is displayed in a row-and-column format.

Datasheet view
A view that displays data from a table, form, query, view, or stored procedure in a row-and-column format. In Datasheet view, you can edit fields, add and delete data, and search for data. In Access, you can also modify and add fields to a table in Datasheet view.

Date expression
Any expression that can be interpreted as a date, including date literals, numbers that look like dates, strings that look like dates, and dates returned from functions.

Date literal
Any sequence of characters with a valid format that is surrounded by number signs (#). Valid formats include the date format specified by the locale settings for your code or the universal date format.

Date separators
Characters used to separate the day, month, and year when date values are formatted. The characters are determined by system settings or by using the Format function.

Date/Time data type
An Access database data type that is used to hold date and time information.

Date time Data type
In an Access project, a date and time data type that ranges from January 1, 1753, to December 31, 9999, to an accuracy of three-hundredths of a second, or 3.33 milliseconds.

Default control style
The default property setting of a control type. You customize a control type before you create two or more similar controls to avoid customizing each control individually.

Default property
A property that you can set for a control so that each time a new control of that type is created, the property will have the same value.

Default value
A value that is automatically entered in a field or control when you add a new record. You can either accept the default value or override it by typing a value.

Delete query
A query (SQL statement) that removes rows matching the criteria that you specify from one or more tables.

Design view
A view that shows the design of these database objects: tables, queries, forms, reports, and macros. In Design view, you can create new database objects and modify the design of existing objects.

Detail area
The part of PivotTable view that contains detail and total fields.

Detail field
A field that displays all rows, or records, from the underlying record source.

Detail section
Used to contain the main body of a form or report. This section usually contains controls bound to the fields in the record source but can also contain unbound controls, such as labels that identify a field's contents.

Direct synchronization
A method used to synchronize data between replicas that are connected directly to the local area network and are available through shared network folders.

Document properties
Properties, such as title, subject, and author, that are stored with each data access page.

Domain
A set of records that is defined by a table, a query, or an SQL expression. Domain aggregate functions return statistical information about a specific domain or set of records.

Domain aggregate function
A function, such as DAvg or DMax, that is used to calculate statistics over a set of records (a domain).

Drop area
An area in PivotTable view or PivotChart view in which you can drop fields from the field list to display the data in the field. The labels on each drop area indicate the types of fields that you can create in the view.

Drop-down list box
A control on a data access page that, when clicked, displays a list from which you can select a value. You cannot type a value in a drop-down list box.

Edit control
Also known as a text box, an edit control is a rectangular region in which a user can enter and Edit text.

Embed
To insert a copy of an OLE object from another application. The source of the object, called the OLE server, can be any application that supports object linking and embedding. Changes to an embedded object are not reflected in the original object.

Enabled database
A previous-version database that has been opened in Access without converting its format. To change the design of the database, you must open it in the version of Access in which it was created.

Error number
A whole number in the range 0 - 65,535 that corresponds to the Number property setting of the Err object. When combined with the Description property setting of the Err object, this number represents a particular error message.

Exclusive
A mode of access to data in a database that is shared over a network. When you open a database in exclusive mode, you prevent others from opening the database.

Expand control
A control on a data access page that, when clicked, expands or collapses a grouped record to display or hide its detail records.

Export
To copy data and database objects to another database, spreadsheet file, or file format so that another database or program can use the data or database objects. You can export data to a variety of supported databases, programs, and file formats.

Expression Builder
An Access tool that you can use to create an expression. It includes a list of common expressions that you can select.

External database
The source of the table that is to be linked or imported to the current database, or the destination of a table that is to be exported.

External table
A table outside the currently open Access database or Access project.

Field data types
A characteristic of a field that determines what kind of data it can store. For example, a field whose data type is Text can store data consisting of either text or numeric characters, but a Number field can store only numerical data.

Field List pane
A pane that lists all the fields in the underlying record source or database object.

Field selector
A small box or bar that you click to select an entire column in a datasheet.

File number
A number used in the Open statement to open a file. Use file numbers in the range 1 - 255, inclusive, for files that are not accessible to other programs. Use file numbers in the range 256 - 511 for files accessible from other programs.

Fill
A report magnification that fills the Report Snapshot window by fitting either the width or the height of a page, depending on whether the report is in portrait or landscape orientation.

Filter
A set of criteria applied to data in order to display a subset of the data or to sort the data. In Access, you can use filtering techniques, such as Filter By Selection and Filter By Form, to filter data.

Filter area
The part of a PivotTable view or PivotChart view that contains filter fields.

Filter By Form
A technique for filtering data that uses a version of the current form or datasheet with empty fields in which you can type the values that you want the filtered records to contain.

Filter By Selection
A technique for filtering records in a form or datasheet in which you retrieve only records that contain the selected value.

Filter field
A field in the filter area that you can use to filter data displayed in PivotTable view or PivotChart view. Filter fields perform the same functions as page fields in Microsoft Excel PivotTable reports.

Filter For Input
A technique for filtering records that uses a value or expression that you enter to find only records that contain the value or satisfy the expression.

Fixed-width text file
A file containing data in which each field has a fixed width.

Foreign key
One or more table fields (columns) that refer to the primary key field or fields in another table. A foreign key indicates how the tables are related.

Foreign table
A table (such as Customer Orders) that contains a foreign key field (such as CustomerID) that is the primary key field in another table (such as Customers) in the database and that is usually on the "many" side of a one-to-many relationship

Form
An Access database object on which you place controls for taking actions or for entering, displaying, and editing data in fields.

Form footer
Used to display instructions for using a form, command buttons, or unbound controls to accept input. Appears at the bottom of the form in Form view and at the end of a printout.

Form header
Used to display a title for a form, instructions for using the form, or command buttons that open related forms or carry out other tasks. The form header appears at the top of the form in Form view and at the beginning of a printout.

Form module
A module that includes Visual Basic for Applications (VBA) code for all event procedures triggered by events occurring on a specific form or its controls.

Form object tab
An object tab in which you work with forms in Design view, Form view, Datasheet view, or Print Preview.

Form properties
Attributes of a form that affect its appearance or behaviour. For example, the DefaultView property is a form property that determines whether a form will automatically open in Form view or Datasheet view.

Form selector
The box where the rulers meet, in the upper-left corner of a form in Design view. Use the box to perform form-level operations, such as selecting the form.

Form view
A view that displays a form that you use to show or accept data. Form view is the primary means of adding and modifying data in tables. You can also change the design of a form in this view.

Format
Specifies how data is displayed and printed. An Access database provides standard formats for specific data types, as does an Access project for the equivalent SQL data types. You can also create custom formats.

Function
A query that takes input parameters and returns a result like a stored procedure. Types: scalar (multistatement; returns one value), inline (one statement; an updateable table value), and table (multistatement; table value).

Function procedure
In Visual Basic for Applications (VBA), a procedure that returns a value and that can be used in an expression. You declare a function by using the Function statement and end it by using the End Function statement.

General sort order
The default sort order determines how characters are sorted in the entire database, such as in tables, queries, and reports. You should define the General sort order if you plan to use a database with multiple language editions of Access.

Grid (Datasheet view)
Vertical and horizontal lines that visually divide rows and columns of data into cells in a table, query, form, view, or stored procedure. You can show and hide these grid lines.

Grid (Design view)
An arrangement of vertical and horizontal dotted and solid lines that help you position controls precisely when you design a form or report.

Group account
A collection of user accounts in a workgroup, identified by group name and personal ID (PID). Permissions assigned to a group apply to all users in the group.

Group filter control
A drop-down list box control on a data access page that retrieves records from an underlying record set based on the value that you select from the list. On a grouped page, the control retrieves a specific group of records.

Group footer
Used to place information, such as group name or group total, at the end of a group of records.

Group header
Used to place information, such as group name or group total, at the beginning of a group of records.

Group level
The depth at which a group in a report or data access page is nested inside other groups. Groups are nested when a set of records is grouped by more than one field, expression, or group record source.

Grouped controls
Two or more controls that can be treated as one unit while designing a form or report. You can select the group instead of selecting each individual control as you are arranging controls or setting properties.

Grouped data access page
A data access page that has two or more group levels.

GUID data type
A unique identification string used with remote procedure calls. Every interface and object class uses a GUID (Globally Unique Identifier) for identification. A GUID is a 128-bit value.

Host application
Any application that supports the use of Visual Basic for Applications.

Hub
A global replica to which all replicas in the replica set synchronize their changes. The hub serves as the parent replica.

Hyperlink address
The path to a destination such as an object, document, or Web page. A hyperlink address can be a URL (address to an Internet or intranet site) or a UNC network path (address to a file on a local area network).

Hyperlink data type
A data type for an Access database field that stores hyperlink addresses.

An address can have up to four parts and is written using the following format: displaytext#address#subaddress#.

Hyperlink field
A field that stores hyperlink addresses. In an Access database, it is a field with a Hyperlink data type. In an Access project, it is a field that has the IsHyperlink property set to True.

Hyperlink image control
A control that is used on a data access page to display an unbound image that represents a hyperlink to a file or Web page. In Browse mode, you can click the image to go to the target location.

Identifier (expressions)
An element of an expression that refers to the value of a field, control, or property. For example, Forms![Orders]![OrderID] is an identifier that refers to the value in the OrderID control on the Orders form.

Identifier (Visual Basic)
A data member in a Visual Basic code module. An identifier can be a Sub, Function, or Property procedure, a variable, a constant, a DECLARE statement, or a user-defined data type.

Image control
A control that is used to display a picture on a form or report.

Import
To copy data from a text file, spreadsheet file, or database table into an Access table. You can use the imported data to create a new table, or you can append (add) it to an existing table that has a matching data structure.

Import/export specification
A specification that stores the information that Access needs to run an import or export operation on a fixed-width or delimited text file.

Index
A feature that speeds up searching and sorting in a table based on key values and can enforce uniqueness on the rows in a table. The primary key of a table is automatically indexed. Some fields cannot be indexed because of their data type, such as OLE Object or Attachment.

Indexes window
In an Access database, a window in which you can view or edit a table's indexes or create multiple-field indexes.

Internet synchronization
Used to synchronize replicas in a disconnected environment in which an Internet server is configured. You must use the Replication Manager to configure Internet synchronization.

Item
A unique element of data within a field. When a lower level of items is available for display in a PivotTable list or the field list, an expand indicator (+) appears beside the item.

Keyboard handler
Code that determines and responds to keys or key combinations pressed by the user.

Label
A control that displays descriptive text, such as a title, a caption, or instructions, on a form or report. Labels may or may not be attached to another control.

Layout view
In Access 2010, a view in which you can make many types of design changes to forms and reports while viewing live data.

Legend
A box that identifies the patterns or colors assigned to data series or categories in a chart.

Link (tables)
An action that establishes a connection to data from another program so that you can view and edit the data in both the original program and in Access.

Linked table
A table stored in a file outside the open database from which Access can access records. You can add, delete, and edit records in a linked table, but you cannot change its structure.

List index
The sequence of numbers for items in a list, starting with 0 for the first item, 1 for the second item, and so on.

Local object
A table, query, form, report, macro, or module that remains in the replica or Design Master in which it was created. Neither the object nor changes to the object are copied to other members in the replica set.

Local replica
A replica that exchanges data with its hub or a global replica but not with other replicas in the replica set.

Locale
The set of information that corresponds to a given language and country.

Lookup field
A field, used on a form or report in an Access database, that either displays a list of values retrieved from a table or query, or stores a static set of values.

Macro
An action or set of actions that you can use to automate tasks.

Macro Builder
The object tab in which you create and modify macros. You can start the Macro Builder from a variety of places, such as a form or report, or directly from the Create tab on the Ribbon.

Macro group
A collection of related macros that are stored together under a single macro name. The collection is often referred to simply as a macro.

Main form
A form that contains one or more subforms.

Make-table query
A query (SQL statement) that creates a new table and then creates records (rows) in that table by copying records from an existing table or query results.

Manual link
A link that requires you to take action to update your data after the data in the source document changes.

Many-to-many relationship
An association between two tables in which one record in either table can relate to many records in the other table. To establish a many-to-many relationship, create a third table and add the primary key fields from the other two tables to this table.

Memo data type
In an Access database, this is a field data type. Memo fields can contain up to 65,535 characters.

Microsoft Access data file
An Access database or Access project file. An Access 2007 database stores database objects and data in an .accdb file, and earlier versions of Access use the .mdb format. A project file does not contain data, and is used to connect to a Microsoft SQL Server database.

Microsoft Access database
A collection of data and objects (such as tables, queries, or forms) that is related to a particular topic or purpose

Microsoft Access object
An object, defined by Access, that relates to Access, its interface, or an application's forms and reports. In addition, you can use a Microsoft Access object to program the elements of the interface used for entering and displaying data.

Microsoft Access project
An Access file that connects to a Microsoft SQL Server database and is used to create client/server applications. A project file doesn't contain any data or data-definition-based objects, such as tables and views.

Microsoft Data Engine
A client/server data engine that provides local data storage on a smaller computer system, such as a single-user computer or small workgroup server, and that is compatible with Microsoft SQL Server 6.5, SQL Server 7.0, and SQL Server 2000.

Microsoft SQL Server database
A database in Microsoft SQL Server, it consists of tables, views, indexes, stored procedures, functions, and triggers. You can connect an Access database to SQL Server data by using ODBC or by creating an Access project (*.adp) file.

Module level
Describes any variable or constant declared in the Declarations section of a Visual Basic for Applications (VBA) module or outside of a procedure. Variables or constants declared at the module level are available to all procedures in a module.

Module-level variable
A variable that is declared in the Declarations section of a Visual Basic for Applications (VBA) module by using the Private keyword. These variables are available to all procedures in the module.

Move handle
The large square that is displayed in the upper left corner of the selected control or control layout in Design view or Layout view. You can drag the handle to move the control or control layout to another location.

Move mode
The mode in which you can move a column in Datasheet view by using the left and right arrow keys.

Multivalued field
A lookup field that can store more than one value.

Name AutoCorrect
A feature that automatically corrects common side effects that occur when you rename forms, reports, tables, queries, fields, or controls on forms and reports. However, Name AutoCorrect cannot repair all references to renamed objects.

Navigation buttons
The buttons that you use to move through records. These buttons are located in the lower left corner of the Datasheet view and Form view. The buttons are also available in Print Preview so that you can move through the pages of your document.

Navigation Pane
The pane that appears when you open an Access database or an Access project. The Navigation Pane displays the objects in the database, and can be customized to sort and group objects in different ways.

Null
A value you can enter in a field or use in expressions or queries to indicate missing or unknown data. In Visual Basic, the Null keyword indicates a Null value. Some fields, such as primary key fields, can't contain a Null value.
Null field
A field containing a Null value. A null field is not the same as a field that contains a zero-length string (" ") or a field with a value of 0.

Number data type
In an Access database, a field data type designed for numerical data that will be used in mathematical calculations. Use the Currency data type, however, to display or calculate currency values.

Object data type
A fundamental data type representing any object that can be recognized by Visual Basic. Although you can declare any object variable as type Object, it is best to declare object variables according to their specific types.

Object Dependencies pane
Shows objects that have a dependency on the selected object and also objects on which the selected object has dependencies.

Object library
A file that contains definitions of objects and their methods and properties. The file that contains an object library typically has the file name extension .olb.

Object type
A type of object exposed by a program through Automation; for example, Application, File, Range, and Sheet. Use the Object Browser in the Visual Basic Editor or refer to the program's documentation for a complete listing of available objects.

Object variable
A variable that contains a reference to an object.

OLE container
A program that contains a linked or embedded OLE object from another program. For example, if an OLE object in an Access database contains an Excel worksheet, Access is the OLE container.

OLE DB
A component database architecture that provides efficient network and Internet access to many types of data sources, including relational data, mail files, flat files, and spreadsheets.

OLE object
An object supporting the OLE protocol for object linking and embedding. An OLE object from an OLE server (for example, a Windows Paint picture or an Excel worksheet) can be linked or embedded in a field, form, or report.

OLE Object data type
A field data type that you use for objects created in other programs that can be linked or embedded (inserted) in an Access database.

OLE server
A program or DLL that supplies a linked or embedded OLE object to another program. For example, if an OLE object in an Access database contains an Excel worksheet, Excel is the OLE server.

One-to-one relationship
An association between two tables in which the primary key value of each record in the primary table corresponds to the value in the matching field or fields of one, and only one, record in the related table.

Option button
A control, also called a radio button, that is typically used as part of an option group to present alternatives on a form or report. A user cannot select more than one option.

Option group
A frame that can contain check boxes, toggle buttons, and option buttons on a form or report. You use an option group to present alternatives from which the user can select a single option.

Outer join
A join in which each matching record from two tables is combined into one record in the query's results, and at least one table contributes all of its records, even if the values in the joined field don't match those in the other table.

Owner
When security is being used, the user account that has control over a database or database object. By default, the user account that created a database or database object is the owner.

Page (data storage)
A portion of the database file in which record data is stored. Depending on the size of the records, a page (4 KB in size) may contain more than one record.

Page footer
Used to display page summaries, dates, or page numbers at the bottom of every page in a form or report. In a form, the page footer appears only when you print the form.
Page header
Used to display a title, column headings, dates, or page numbers at the top of every page in a form or report. In a form, the page header appears only when you print the form.

Parameter query
A query in which a user interactively specifies one or more criteria values. A parameter query is not a separate kind of query; rather, it extends the flexibility of a query.

Partial replica
A database that contains only a subset of the records in a full replica. With a partial replica, you can set filters and identify relationships that define which subset of the records in the full replica should be present in the database.
Personal ID
A case-sensitive alphanumeric string that is 4 to 20 characters long and that Access uses in combination with the account name to identify a user or group in an Access workgroup.

PivotChart view
A view that shows a graphical analysis of data in a datasheet or form. You can see different levels of detail or specify the layout by dragging fields and items or by showing and hiding items in the drop-down lists for the fields.

PivotTable form
An interactive table that summarizes large amounts of data by using format and calculation methods that you choose. You can rotate its row and column headings to view the data in different ways, similar to an Excel PivotTable report.

PivotTable list
A Microsoft Office Web Component that is used to analyze data interactively on a Web page. Data displayed in a row and column format can be moved, filtered, sorted, and calculated in ways that are meaningful for your audience.

PivotTable view
A view that summarizes and analyzes data in a datasheet or form. You can use different levels of detail or organize data by dragging the fields and items or by showing and hiding items in the drop-down lists for the fields.

Primary key
One or more fields (columns) whose values uniquely identify each record in a table. A primary key cannot allow Null values and must always have a unique index. A primary key is used to relate a table to foreign keys in other tables.

Primary table
The "one" side of two related tables in a one-to-many relationship. A primary table should have a primary key and each record should be unique.

Procedure
A sequence of declarations and statements in a module that are executed as a unit. Procedures in a Visual Basic for Applications (VBA) module include both Sub and Function procedures.

Procedure level
Describes any variables or constants declared within a procedure. Variables and constants declared within a procedure are available to that procedure only.

Procedure-level variable
A variable that is declared within a procedure. Procedure-level variables are always private to the procedure in which they're declared.

Project
The set of all code modules in a database, including standard modules and class modules. By default, the project has the same name as the database.

Property sheet
A pane that is used to view or modify the properties of various objects such as tables, queries, fields, forms, reports, data access pages, and controls.

Publication
In an Access project, a publication can contain one or more published tables or stored procedure articles from one user database. Each user database can have one or more publications. An article is a grouping of data replicated as a unit.

Publish
To save a database to a document management server, such as a server running Windows SharePoint Services.

Query
A question about the data stored in your tables, or a request to perform an action on the data. A query can bring together data from multiple tables to serve as the source of data for a form or report.

Query window A window in which you work with queries in Design view, Datasheet view, SQL view, or Print Preview.

QueryDef
a stored definition of a query in an Access database, or a temporary definition of a query in an ODBCDirect workspace.

Record navigation control
A control used on a data access page to display a record navigation toolbar. In a grouped page, you can add a navigation toolbar to each group level. You can customize the record navigation control by changing its properties.

Record number box
A small box that displays the current record number in the lower-left corner in Datasheet view and Form view. To move to a specific record, you can type the record number in the box, and press ENTER.

Record selector
A small box or bar to the left of a record that you can click to select the entire record in Datasheet view and Form view.

Record source
The underlying source of data for a form, report, or data access page. In an Access database, it can be a table, query, or SQL statement. In an Access project, it can be a table, view, SQL statement, or stored procedure.

Recordset
The collective name given to table-, dynaset-, and snapshot-type Recordset objects, which are sets of records that behave as objects.

Referenced database
The Access database to which the user has established a reference from the current database. The user can create a reference to a database and then call procedures within standard modules in that database.

Referencing database
The current Access database from which the user has created a reference to another Access database. The user can create a reference to a database and then call procedures within standard modules in that database.

Referential integrity
Rules that you follow to preserve the defined relationships between tables when you add, update, or delete records.

Refresh
In an Access database, to redisplay the records in a form or datasheet to reflect changes that other users have made. In an Access project, to rerun a query underlying the active form or datasheet in order to reflect changes to records.

Relationship
An association that is established between common fields (columns) in two tables. A relationship can be one-to-one, one-to-many, or many-to-many.

Relationships object tab
An object tab in which you view, create, and modify relationships between tables and queries.

Relative or inline positioning
Places the element in the natural HTML flow of the document but offsets the position of the element based on the preceding content.
Repaint

To redraw the screen. The Repaint method completes any pending screen updates for a specified form.

Replica
A copy of a database that is a member of a replica set and can be synchronized with other replicas in the set. Changes to the data in a replicated table in one replica are sent and applied to the other replicas.

Report
An Access database object that that you can print containing information that is formatted and organized according to your specifications. Examples of reports are sales summaries, phone lists, and mailing labels.

Report footer
A report section that is used to place information that normally appears at the bottom of the page, such as page numbers, dates, and sums.

Report header
A report section that is used to place information (such as a title, date, or report introduction) at the beginning of a report.

Report module
A module that includes Visual Basic for Applications (VBA) code for all event procedures triggered by events occurring on a specific report or its controls.

Report object tab
An object tab in which you work with reports in Design view, Layout Preview, or Print Preview.
Report selector
The box where the rulers meet in the upper-left corner of a report in Design view. Use the box to perform report-level operations, such as selecting the report.

Row area
The part of PivotTable view that contains row fields.

Row field
A field in the row area of PivotTable view. Items in row fields are listed down the left side of the view. Inner row fields are closest to the detail area; outer row fields are to the left of the inner row fields.

Row selector
A small box or bar that, when clicked, selects an entire row in table or macro Design view or when you sort and group records in report Design view.

Section
A part of a form or report, such as a header, footer, or detail section.

Section header
The horizontal bar above a form or report section in Design view. The section bar displays the type and name of the section. Use it to access the section's property sheet.

Section selector
The box on the left side of a section bar when an object is open in Design view. Use the box to perform section-level operations, such as selecting the section.

Secure workgroup
An Access workgroup in which users log on with a user name and password and in which access to database objects is restricted according to permissions granted to specific user accounts and groups.

Select query
A query that asks a question about the data stored in your tables and returns a result set in the form of a datasheet, without changing the data.

Selection rectangle
The rectangle formed by the currently selected rows (records) and columns (fields) within Datasheet view.

Separator
A character that separates units of text or numbers.

Series field
A field that is displayed in the series area of a chart and that contains series items. A series is a group of related data points.

Series point
An individual data value that is plotted in a chart and represented by a column, bar, line, pie or doughnut slice, or other type of data marker.

Session
A sequence of operations performed by the Access database engine that begins when a user logs on and ends when the user logs off. All operations during a session form one transaction scope and are subject to the user's logon permissions.

Snapshot
A static image of a set of data, such as the records displayed as the result of a query. Snapshot-type Record set objects can be created from a base table, a query, or another record set.

Snapshot Viewer
A program that you can use to view, print, or mail a snapshot, such as a report snapshot. Snapshot Viewer consists of a stand-alone executable program, a Snapshot Viewer control (Snapview.ocx), and other related files.

Snapshot Viewer control
An ActiveX control (Snapview.ocx) that you use to view a snapshot report from Microsoft Internet Explorer 3.0 or later, or from any program that supports ActiveX controls, such as Access or Microsoft Visual Basic.

SQL database
A database that is based on Structured Query Language (SQL).

Standard deviation
A parameter that indicates the way in which a probability function is centered around its mean and that is equal to the square root of the moment in which the deviation from the mean is squared.

Standard module
A Visual Basic for Applications (VBA) module in which you can place Sub and Function procedures that you want to be available to other procedures throughout your database.

Stored procedure
A precompiled collection of SQL statements and optional control-of-flow statements that is stored under a name and processed as a unit. The collection is stored in an SQL database and can be run with one call from a program.

String delimiter
Text characters that set apart a string embedded within a string. Single quotation marks (') and double quotation marks (") are string delimiters.

Sub procedure
A Visual Basic for Applications (VBA) procedure that carries out an operation. Unlike a Function procedure, a Sub procedure doesn't return a value. You begin a Sub procedure with a Sub statement and end it with an End Sub statement.

Subdatasheet
A datasheet that is nested within another datasheet and that contains data related or joined to the first datasheet.

Subform
A form contained within another form or a report.
Subform/Subreport control
A control that displays a subform in a form or a subform or a subreport in a report.

Subquery
An SQL SELECT statement that is inside another select or action query.

Subreport
A report that is contained within another report.

Subscribe
To agree to receive a publication in an Access database or an Access project. A subscriber database subscribes to replicated data from a publisher database.

Subscription
The database that receives tables and data replicated from a publisher database in an Access project.

Synchronization
The process of updating two members of a replica set by exchanging all updated records and objects in each member. Two replica set members are synchronized when the changes in each have been applied to the other.

Tab control
A control that you can use to construct a single form or dialog box that contains several pages, each with a tab, and each containing similar controls, such as text boxes or option buttons. When a user clicks a tab, that page becomes active.

Table
A database object that stores data in records (rows) and fields (columns). The data is usually about a particular category of things, such as employees or orders.

Table data type
In an Access project, a special data type that is used to store a result set in a local variable or return value of a user-defined function for later processing. It can be used in place of a temporary table stored in the tempdb database.
Table object tab
In an Access database, an object tab in which you work with tables in Design view or Datasheet view.

Table properties
In an Access database, attributes of a table that affect the appearance or behavior of the table as a whole. Table properties are set in table Design view, as are field properties.

Text box
A control, also called an edit field, that is used on a form or report to display text or accept data entry. A text box can have a label attached to it.
Text data type
In an Access database, this is a field data type. Text fields can contain up to 255 characters or the number of characters specified by the FieldSize property, whichever is less.

Toolbox
A set of tools that is available in Design view for adding controls to a form or report.

ToolTips
Brief descriptions of the names of commands and buttons on the Ribbon. A ToolTip is displayed when the mouse pointer rests on these commands and buttons.

Topology
The order in which changes are propagated from replica to replica. Topology is important because it determines how quickly changes in another replica appear in your replica.

Total field
A field that summarizes data from the underlying record source. A total field can use a summary function, such as Sum or Count, or use an expression to calculate summary values.

Total row
A row on a datasheet that displays your choice of summary information for each field, based on the type of data in the field.

Total query
A query that displays a summary calculation, such as an average or sum, for values in various fields from a table or tables. A totals query is not a separate kind of query; rather, it extends the flexibility of select queries.

Update
To accept changes to data in a record. The changes are saved in the database when you move to another record on a form or datasheet, or when you explicitly save the record.

Update query
An action query (SQL statement) that changes a set of records according to criteria (search conditions) that you specify.
Updateable snapshot
A type of record set that works efficiently in a client/server environment by caching data on the client and minimizing round trips to the server to access and update data.

User account
An account identified by a user name and personal ID (PID) that is created to manage the user's permissions to access database objects in an Access workgroup.

User defined data type
In a Microsoft SQL Server database, a definition of the type of data a column can contain. It is defined by the user, and based on existing SQL Server data types. Rules and defaults can only be bound to user-defined data types.

User defined type
In Visual Basic for Applications (VBA), any data type defined by using the Type statement. User-defined data types can contain one or more elements of any data type. Arrays of user-defined and other data types are created using the Dim statement.

User-defined collection
A collection that you create by adding objects to a Collection object. Items in a collection defined by the Collection object are indexed, beginning with 1.

User-defined function
A query that takes input parameters and returns a result, similar to a stored procedure. Types: scalar (multistatement; returns one value), inline (one statement; an updateable table value), and table (multistatement; table value).

User-defined object
A custom object that is defined in a form or report class module. In a class module, you can create properties and methods for a new object, create a new instance of the object, and manipulate the object by using those properties and methods.

User-level security
When using user-level security in an Access database, a database administrator or an object's owner can grant individual users or groups of users specific permissions to tables, queries, forms, reports, and macros.

Users group
The group account that contains all user accounts. Access automatically adds user accounts to the Users group when you create them.

View
In an Access project, a type of query that is a virtual table based on an SQL SELECT statement. For example, a view may contain only 3 out of 10 available columns in a join of two tables, in order to limit access to certain data.

Visibility
A property of a replica that indicates which members of the replica set it can synchronize with and which conflict resolution rules apply. Replicas fall into three visibility types: global, local, and anonymous.

XML attribute
Information that is added to a tag to provide more information about the tag, such as <ingredient quantity="2"units="cups">flour</ingredient>. In this example, quantity and units are attributes.

XML element
Information that is delimited by a start and end tag in an Extended Markup Language (XML) document. An example of an XML element is <LastName>Davolio</LastName>.

XML entities
Combinations of characters and symbols that replace other characters when an XML document is parsed, usually those that have other meanings in XML. For example, < represents the < symbol, which is also the opening bracket for a tag.

Yes/No data type
A field data type that you use for fields that will contain only one of two values, such as Yes or No and True or False. Null values are not allowed.

FODE SUBJECTS AND COURSE PROGRAMMES

GRADE LEVELS	SUBJECTS/COURSES
Grades 7 and 8	1. English
	2. Mathematics
	3. Personal Development
	4. Social Science
	5. Science
	6. Making a Living
Grades 9 and 10	1. English
	2. Mathematics
	3. Personal Development
	4. Science
	5. Social Science
	6. Business Studies
	7. Design and Technology- Computing
Grades 11 and 12	1. English – Applied English/Language& Literature
	2. Mathematics - Mathematics A / Mathematics B
	3. Science – Biology/Chemistry/Physics
	4. Social Science – History/Geography/Economics
	5. Personal Development
	6. Business Studies
	7. Information & Communication Technology

REMEMBER:

- For Grades 7 and 8, you are required to do all six (6) subjects.
- For Grades 9 and 10, you must complete five (5) subjects and one (1) optional to be certified. Business Studies and Design & Technology – Computing are optional.
- For Grades 11 and 12, you are required to complete seven (7) out of thirteen (13) subjects to be certified.

Your Provincial Coordinator or Supervisor will give you more information regarding each subject and course.

GRADES 11 & 12 COURSE PROGRAMMES

No	Science	Humanities	Business
1	Applied English	Language & Literature	Language & Literature/Applied English
2	Mathematics A/B	Mathematics A/B	Mathematics A/B
3	Personal Development	Personal Development	Personal Development
4	Biology	Biology/Physics/Chemistry	Biology/Physics/Chemistry
5	Chemistry/ Physics	Geography	Economics/Geography/History
6	Geography/History/Economics	History / Economics	Business Studies
7	ICT	ICT	ICT

Notes: You must seek advice from your Provincial Coordinator regarding the recommended courses in each stream. Options should be discussed carefully before choosing the stream when enrolling into Grade 11. FODE will certify for the successful completion of seven subjects in Grade 12.

CERTIFICATE IN MATRICULATION STUDIES		
No	**Compulsory Courses**	**Optional Courses**
1	English 1	**Science Stream:** Biology, Chemistry, Physics
2	English 2	**Social Science Stream:** Geography, Intro to Economics and Asia and the Modern World
3	Mathematics 1	
4	Mathematics 2	
5	History of Science & Technology	

REMEMBER: You must successfully complete 8 courses: 5 compulsory and 3 optional.

FODE PROVINCIAL CENTRES CONTACTS

PC NO.	FODE PROVINCIAL CENTRE	ADDRESS	PHONE/FAX	CUG PHONES	CONTACT PERSON		CUG PHONE
1	DARU	P. O. Box 68, Daru	6459033	72228146	The Coordinator	Senior Clerk	72229047
2	KEREMA	P. O. Box 86, Kerema	6481303	72228124	The Coordinator	Senior Clerk	72229049
3	CENTRAL	C/- FODE HQ	3419228	72228110	The Coordinator	Senior Clerk	72229050
4	ALOTAU	P. O. Box 822, Alotau	6411343 / 6419195	72228130	The Coordinator	Senior Clerk	72229051
5	POPONDETTA	P. O. Box 71, Popondetta	6297160 / 6297678	72228138	The Coordinator	Senior Clerk	72229052
6	MENDI	P. O. Box 237, Mendi	5491264 / 72895095	72228142	The Coordinator	Senior Clerk	72229053
7	GOROKA	P. O. Box 990, Goroka	5322085 / 5322321	72228116	The Coordinator	Senior Clerk	72229054
8	KUNDIAWA	P. O. Box 95, Kundiawa	5351612	72228144	The Coordinator	Senior Clerk	72229056
9	MT HAGEN	P. O. Box 418, Mt. Hagen	5421194 / 5423332	72228148	The Coordinator	Senior Clerk	72229057
10	VANIMO	P. O. Box 38, Vanimo	4571175 / 4571438	72228140	The Coordinator	Senior Clerk	72229060
11	WEWAK	P. O. Box 583, Wewak	4562231/ 4561114	72228122	The Coordinator	Senior Clerk	72229062
12	MADANG	P. O. Box 2071, Madang	4222418	72228126	The Coordinator	Senior Clerk	72229063
13	LAE	P. O. Box 4969, Lae	4725508 / 4721162	72228132	The Coordinator	Senior Clerk	72229064
14	KIMBE	P. O. Box 328, Kimbe	9835110	72228150	The Coordinator	Senior Clerk	72229065
15	RABAUL	P. O. Box 83, Kokopo	9400314	72228118	The Coordinator	Senior Clerk	72229067
16	KAVIENG	P. O. Box 284, Kavieng	9842183	72228136	The Coordinator	Senior Clerk	72229069
17	BUKA	P. O. Box 154, Buka	9739838	72228108	The Coordinator	Senior Clerk	72229073
18	MANUS	P. O. Box 41, Lorengau	9709251	72228128	The Coordinator	Senior Clerk	72229080
19	NCD	C/- FODE HQ	3230299 Ext 26	72228134	The Coordinator	Senior Clerk	72229081
20	WABAG	P. O. Box 259, Wabag	5471114	72228120	The Coordinator	Senior Clerk	72229082
21	HELA	P. O. Box 63, Tari	73197115	72228141	The Coordinator	Senior Clerk	72229083
22	JIWAKA	c/- FODE Hagen		72228143	The Coordinator	Senior Clerk	72229085