

Module Lecture 4: Database Management System with Microsoft Access Hands-on

Software Requirement for this Module: *Microsoft Access*

At the end of this module you will be able to:

| |
|----------------------------------------------------------------------------------------------------------------------------------------|
| 1. Demonstrate the function and importance of Database in the organization. |
| 2. Create a table and apply record manipulation commands |
| 3. Develop queries and relational databases |
| 4. Build user interface forms and use them for data entry and modification and build reports and use them to analyze database contents |
| 5. Develop a database-driven application to solve a real-world problem. |

Database administrator

○ An information specialist with 4 major areas:

- 1) Planning
- 2) Implementation
- 3) Operation
- 4) Security

1. **Planning**-Involves working with manager to define the firm's schema and users' to define their subschema
2. **Implementation** – creating the database to conform to the specification of the selected DBMS, establishing & enforcing policies and procedures
3. **Operation** – offering educational programs to database users & providing assistance when needed
4. **Security** – monitoring activity using statistics provided by DBMS

Knowledge Discovery database:

- Activities involved in making sense of data stored in large & complex database
- Data warehousing refinement of data concept that improves data resources available to users, 200 gigabytes
- Data mart – data describing only segments of the firm operations
- Data mining – process of finding relationship uses to discover knowledge in database

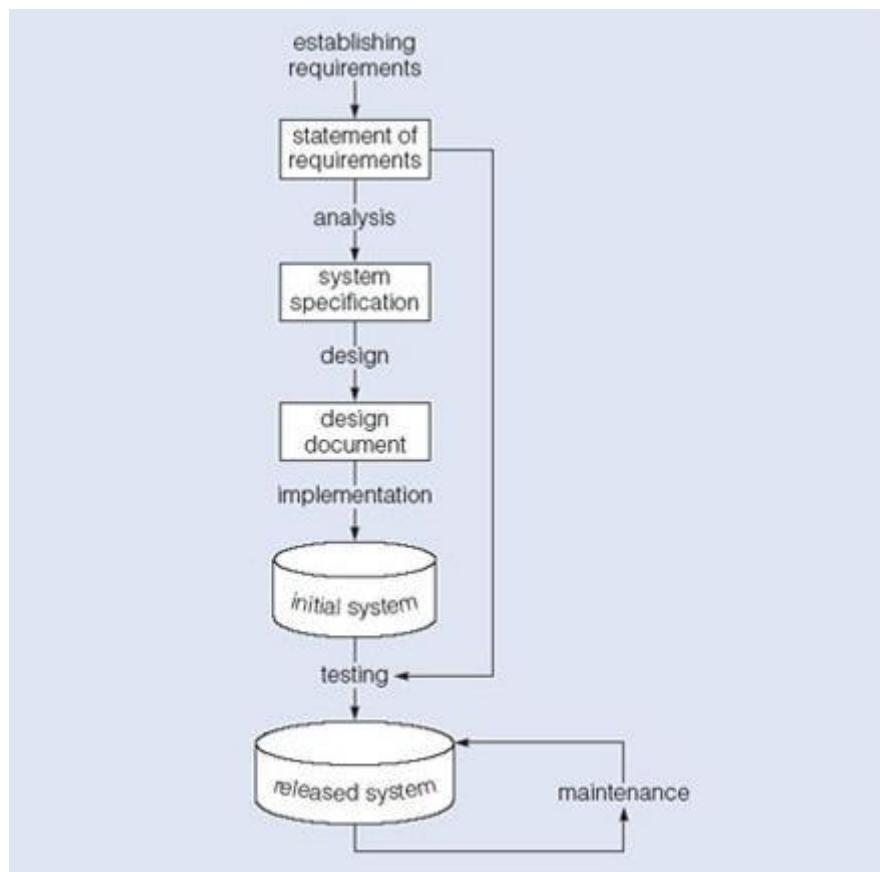
Steps Knowledge Discovery database:

- Define the data & task
- Acquire the data
- Clean the data
- Develop the hypothesis & search mode
- Mine the data
- Test & verify
- Interpret & use

Database Development Process

A core aspect of software engineering is the subdivision of the development process into a series of phases, or steps, each of which focuses on one aspect of the development. The collection of these steps is sometimes referred to as the *software development life cycle (SDLC)*. The software product moves through this life cycle (sometimes repeatedly as it is refined or redeveloped) until it is finally retired from use. Ideally, each phase in the life cycle can be checked for correctness before moving on to the next phase.

Software Development Life Cycle – Waterfall



Let us start with an overview of the *waterfall model* such as you will find in most software engineering textbooks. The waterfall figure above, illustrates a general waterfall model that could apply to any computer system development. It shows the process as a strict sequence of steps where the output of one step is the input to the next and all of one step has to be completed before moving onto the next.

We can use the *waterfall process* as a means of identifying the tasks that are required, together with the input and output for each activity. What is important is the scope of the activities, which can be summarized as follows:

- *Establishing requirements* involves consultation with, and agreement among, stakeholders about what they want from a system, expressed as a statement of requirements.
- *Analysis* starts by considering the statement of requirements and finishes by producing a system specification. The specification is a formal representation of what a system should do, expressed in terms that are independent of how it may be realized.
- *Design* begins with a system specification, produces design documents and provides a detailed description of how a system should be constructed.
- *Implementation* is the construction of a computer system according to a given design document and taking into account the environment in which the system will be operating (e.g., specific hardware or software available for the development). Implementation may be staged, usually with an initial system that can be validated and tested before a final system is released for use.
- *Testing* compares the implemented system against the design documents and requirements specification and produces an acceptance report or, more usually, a list of errors and bugs that require a review of the analysis, design and implementation processes to correct (testing is usually the task that leads to the waterfall model iterating through the life cycle).
- *Maintenance* involves dealing with changes in the requirements or the implementation environment, bug fixing or porting of the system to new environments (e.g., migrating a system from a standalone PC to a UNIX workstation or a networked environment). Since maintenance involves the analysis of the changes required, design of a solution, implementation and testing of that solution over the lifetime of a maintained software system, the waterfall life cycle will be repeatedly revisited.

Microsoft Access - Overview

Microsoft Access is a Database Management System (DBMS) from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and software development tools. It is a member of the Microsoft Office suite of applications, included in the professional and higher editions.

- Microsoft Access is just one part of Microsoft's overall data management product strategy.
- It stores data in its own format based on the Access Jet Database Engine.
- Like relational databases, Microsoft Access also allows you to link related information easily. For example, customer and order data. However, Access 2013 also complements other database products because it has several powerful connectivity features.
- It can also import or link directly to data stored in other applications and databases.
- As its name implies, Access can work directly with data from other sources, including many popular PC database programs, with many SQL (Structured Query Language) databases on the desktop, on servers, on minicomputers, or on mainframes, and with data stored on Internet or intranet web servers.
- Access can also understand and use a wide variety of other data formats, including many other database file structures.
- You can export data to and import data from word processing files, spreadsheets, or database files directly.
- Access can work with most popular databases that support the Open Database Connectivity (ODBC) standard, including SQL Server, Oracle, and DB2.

- Software developers can use Microsoft Access to develop application software.

Microsoft Access stores information which is called a database. To use MS Access, you will need to follow these four steps –

- **Database Creation** – Create your Microsoft Access database and specify what kind of data you will be storing.
- **Data Input** – After your database is created, the data of every business day can be entered into the Access database.
- **Query** – This is a fancy term to basically describe the process of retrieving information from the database.
- **Report (optional)** – Information from the database is organized in a nice presentation that can be printed in an Access Report.

Architecture

- Access calls anything that can have a name an object. Within an Access desktop database, the main objects are tables, queries, forms, reports, macros, data macros, and modules.
- If you have worked with other database systems on desktop computers, you might have seen the term database used to refer to only those files in which you store data.
- But, in Access, a desktop database (.accdb) also includes all the major objects related to the stored data, including objects you define to automate the use of your data.

MS Access uses “objects” to help the user list and organize information, as well as prepare specially designed reports. When you create a database, Access offers you Tables, Queries, Forms, Reports, Macros, and Modules. Databases in Access are composed of many objects but the following are the major objects –

- Tables
- Queries
- Forms
- Reports

Together, these objects allow you to enter, store, analyze, and compile your data. Here is a summary of the major objects in an Access database;

Table

Table is an object that is used to define and store data. When you create a new table, Access asks you to define fields which is also known as column headings.

- Each field must have a unique name, and data type.
- Tables contain fields or columns that store different kinds of data, such as a name or an address, and records or rows that collect all the information about a particular instance of the subject, such as all the information about a customer or employee etc.
- You can define a primary key, one or more fields that have a unique value for each record, and one or more indexes on each table to help retrieve your data more quickly.

Query

An object that provides a custom view of data from one or more tables. 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.
- In Access, you can use the graphical query by example facility or you can write Structured Query Language (SQL) statements to create your queries.
- You can define queries to Select, Update, Insert, or Delete data.
- You can also define queries that create new tables from data in one or more existing tables.

Form

Form is an object in a desktop database designed primarily for data input or display or for control of application execution. You use forms to customize the presentation of data that your application extracts from queries or tables.

- Forms are used for entering, modifying, and viewing records.
- The reason forms are used so often is that they are an easy way to guide people toward entering data correctly.
- When you enter information into a form in Access, the data goes exactly where the database designer wants it to go in one or more related tables.

Report

Report is an object in desktop databases designed for formatting, calculating, printing, and summarizing selected data.

- You can view a report on your screen before you print it.
- If forms are for input purposes, then reports are for output.
- Anything you plan to print deserves a report, whether it is a list of names and addresses, a financial summary for a period, or a set of mailing labels.
- 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.

Other MS Access Objects

Let us now take a look at other MS Access objects.

Macro

This object is a structured definition of one or more actions that you want Access to perform in response to a defined event. An Access Macro is a script for doing some job. For example, to create a button which opens a report, you could use a macro which will fire Open Report action.

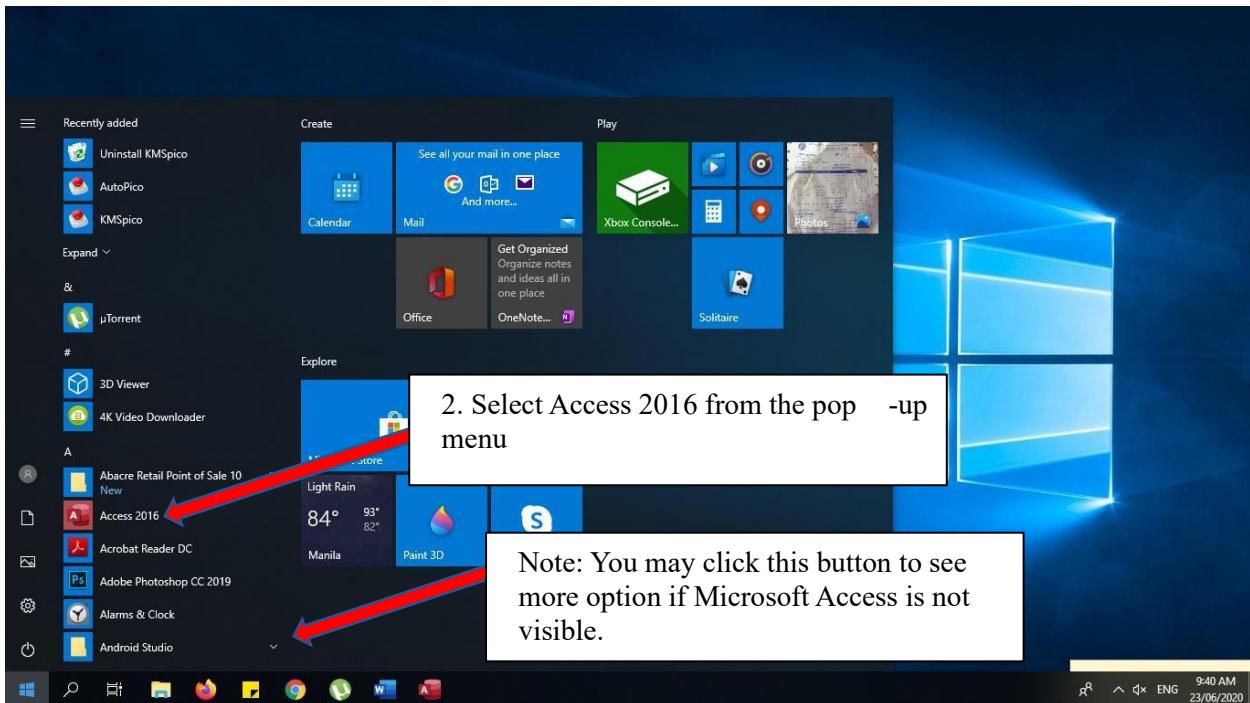
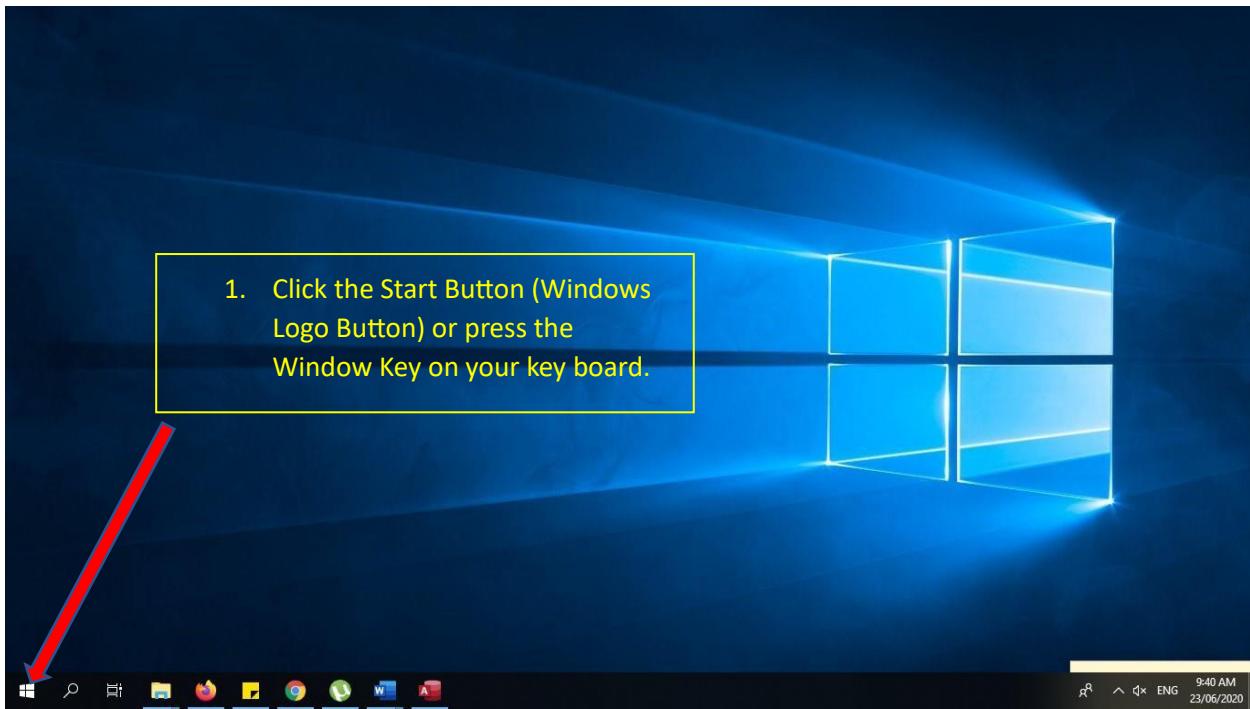
- You can include simple conditions in macros to specify when one or more actions in the macro should be performed or skipped.
- You can use macros to open and execute queries, to open tables, or to print or view reports.
- You can also run other macros or Visual Basic procedures from within a macro.
- Data macros can be attached directly to table events such as inserting new records, editing existing records, or deleting records.
- Data macros in web apps can also be stand-alone objects that can be called from other data macros or macro objects.

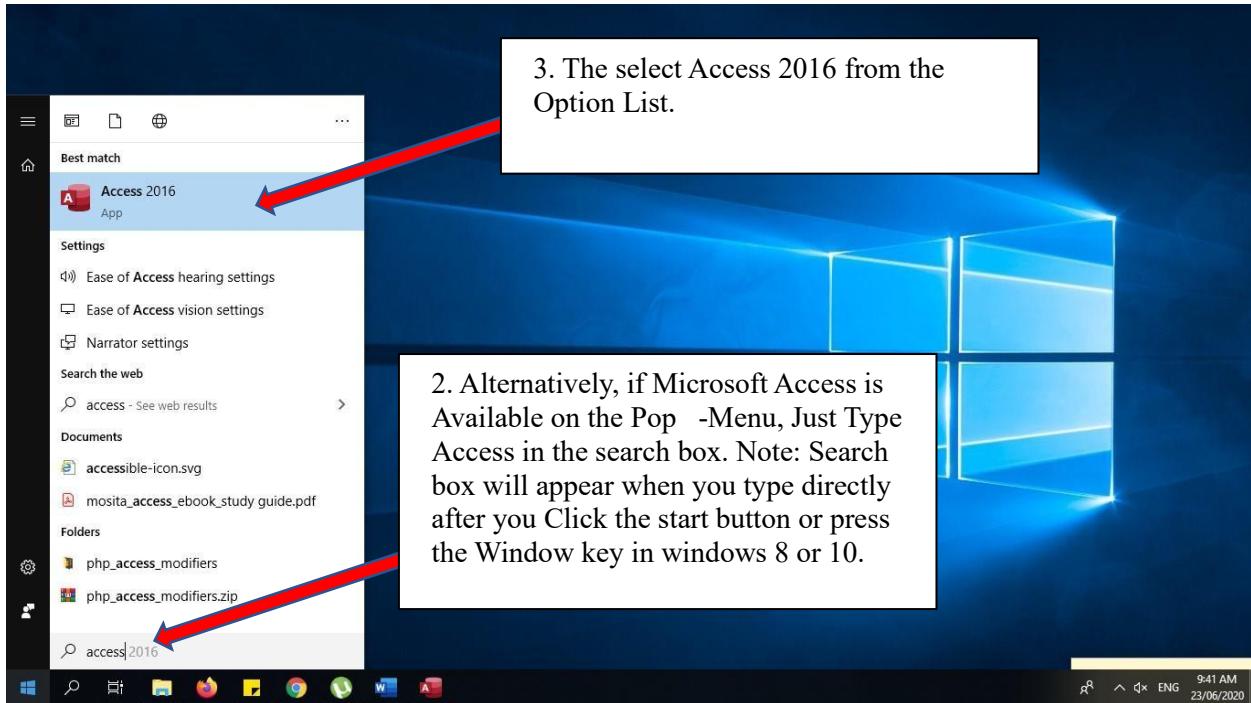
Module

Module is an object in desktop databases containing custom procedures that you code using Visual Basic. Modules provide a more discrete flow of actions and allow you to trap errors.

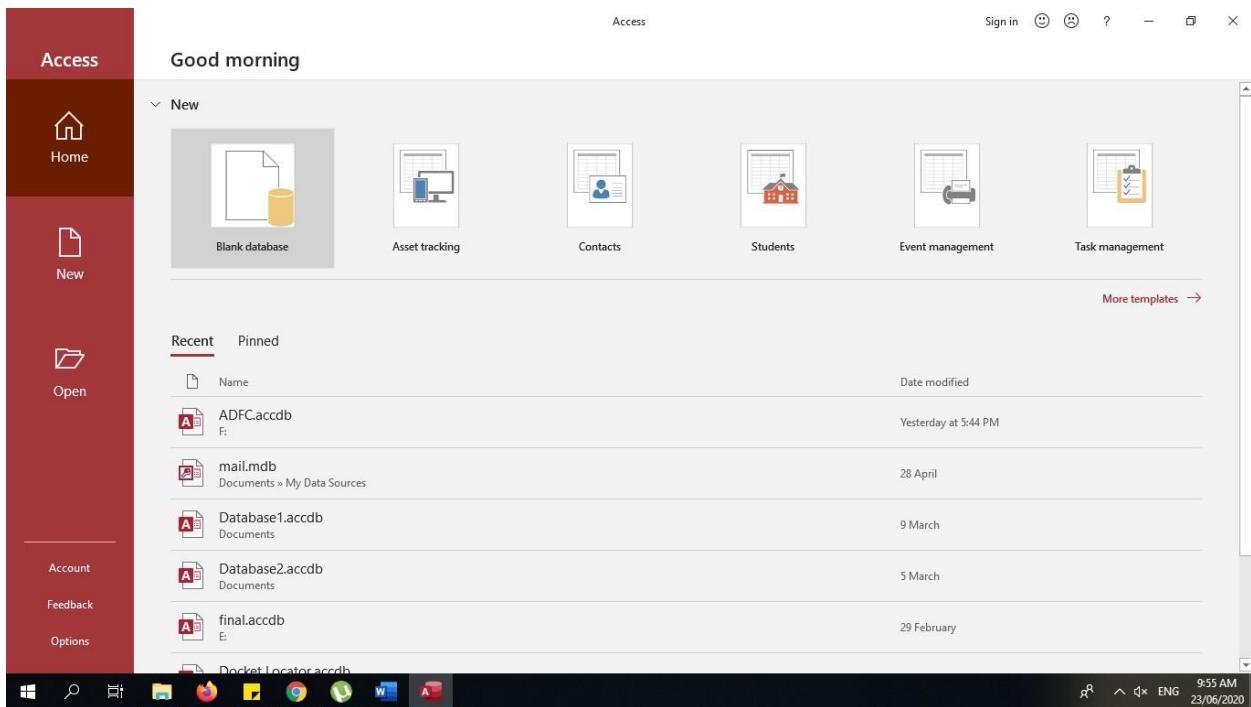
- Everything that can be done in a macro can also be done in a module, but you don't get the macro interface that prompts you what is needed for each action.
- Modules are far more powerful, and are essential if you plan to write code for a multi-user environment, because macros cannot include error handling.
- Modules can be standalone objects containing functions that can be called from anywhere in your application, or they can be directly associated with a form or a report to respond to events on the associated form or report.

Running Microsoft Access Application

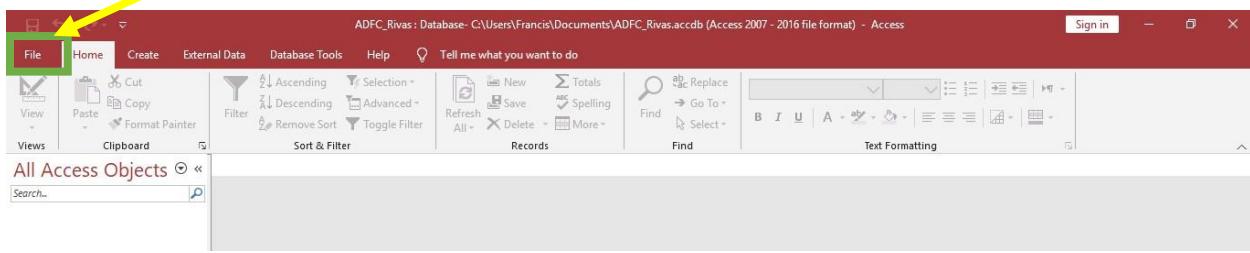




Then Microsoft Access will launch this window called “Backstage View”.

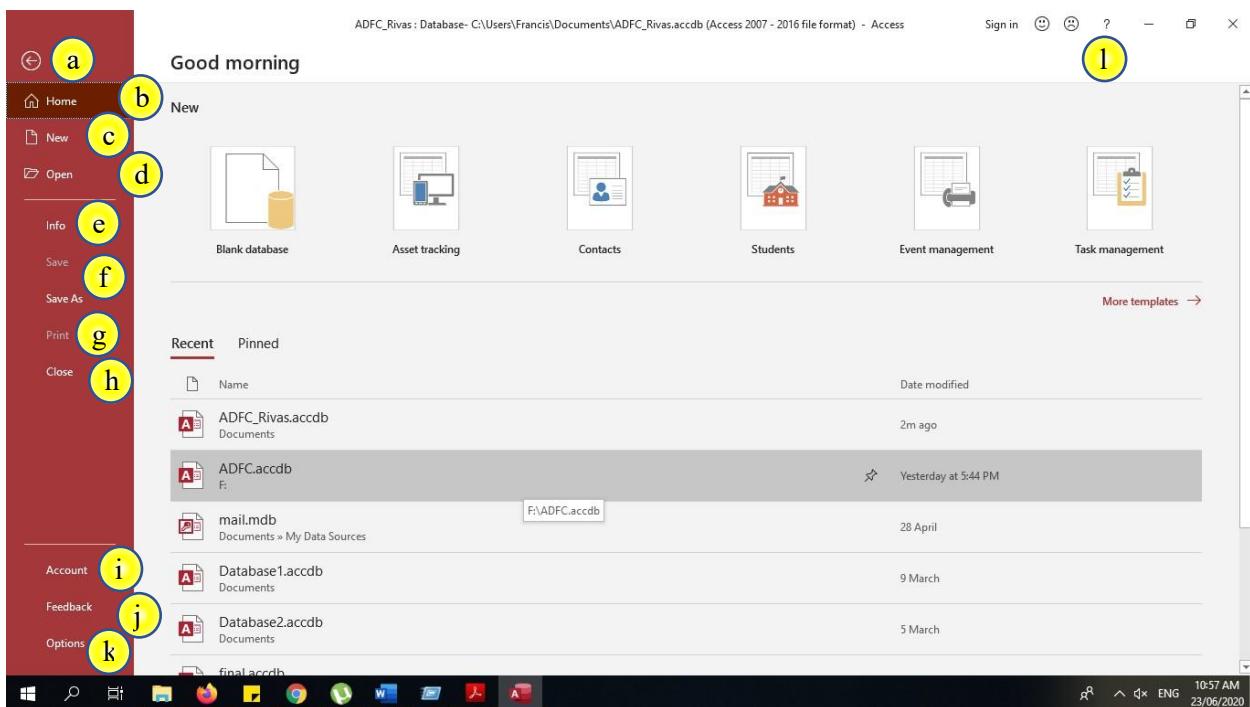


To enter the *Backstage view* after creating your database, click the **File** tab.



The *Backstage view* will open. From here, you can perform the following actions: (see the figure below)

- a. **Back** - To leave the *Backstage View* and return to your document;
- b. **Home** – Display the Backstage View;
- c. **New** - Create new databases and templates;
- d. **Open** - Open existing databases;
- e. **Info** - Obtain information about your databases;
- f. **Save/Save As** - Save and close databases;
- g. **Print** - Print and/or preview of your databases;
- h. **Close** - Close Access 2016 ;
- i. **Account** - Access your *Microsoft Office 2016* account information;
- j. **Feedback** – Access options to give your feedback about Microsoft Access Application;
- k. **Options** - Access options to change program settings and;
- l. **Help** - Obtain help information on using Access 2016





Activity #1

Creating a New Microsoft Access Database and Table

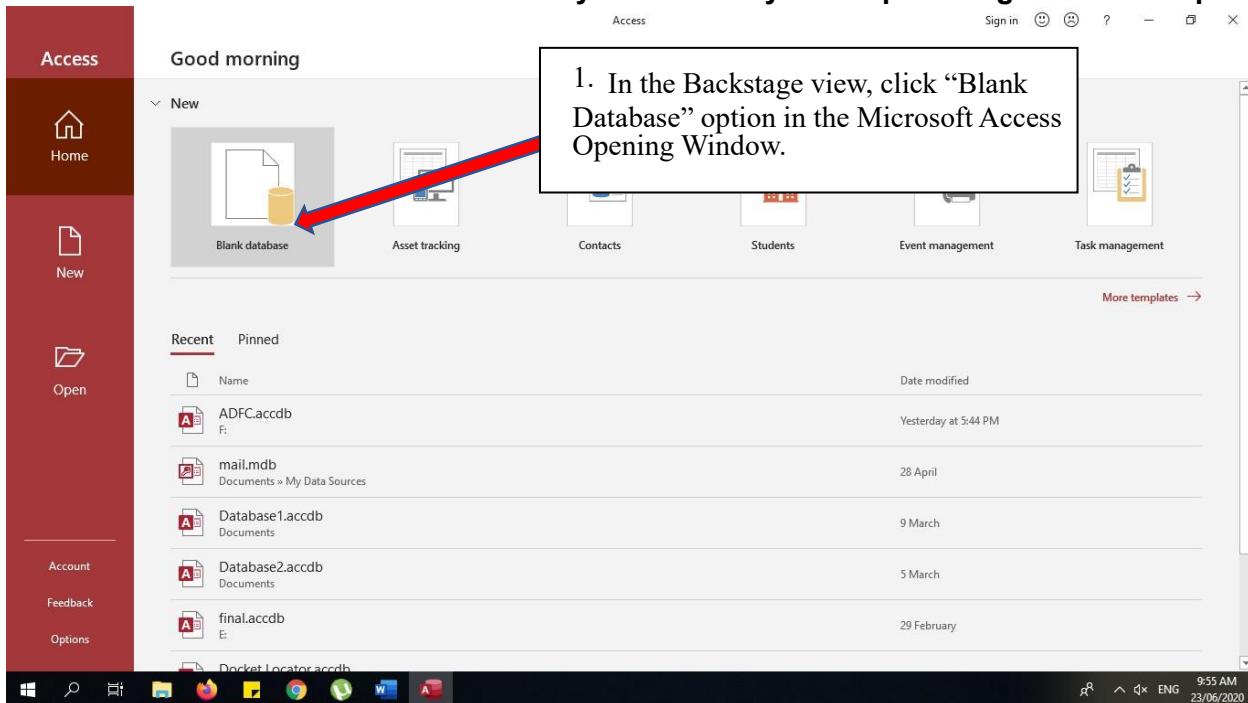
Learning Objectives

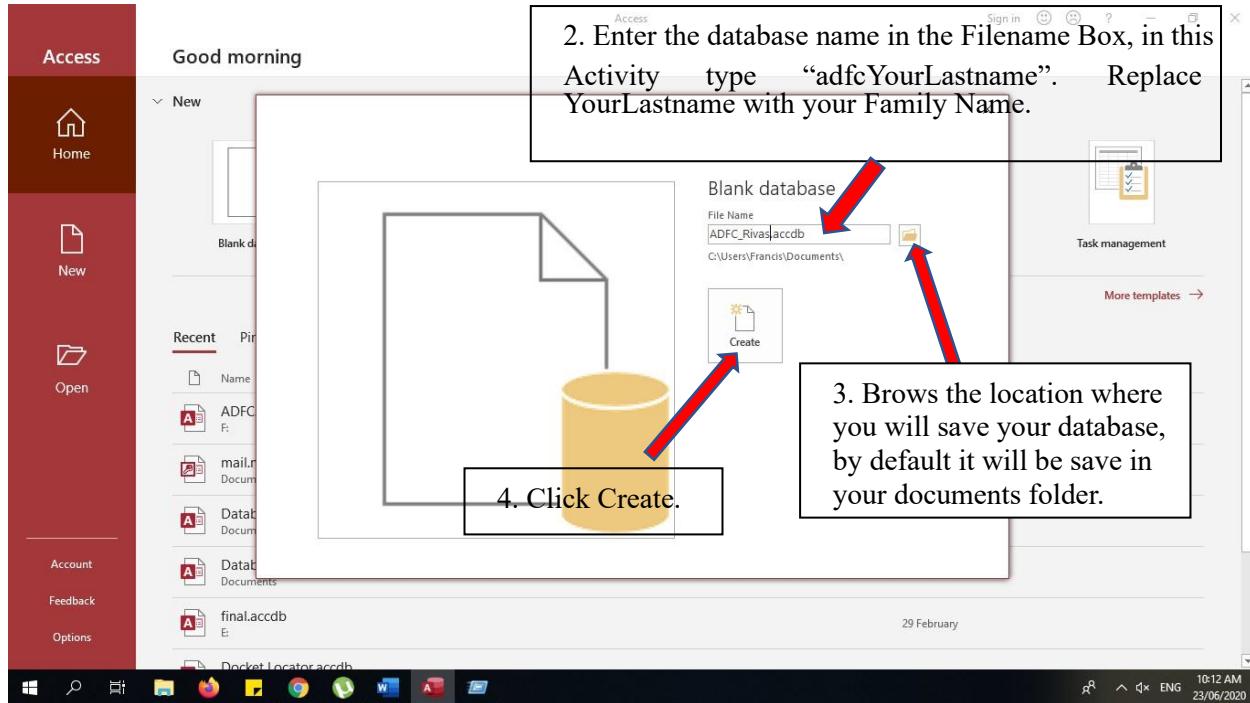
After completing the instructions in this activity, you will be able to:

- Identify the components of the *Access 2016* interface.
- Understand how to use the Tell Me feature.
- Create a new database.
- Understand how to create a table.
- Understand the purpose of the primary key.
- Implement error traps.
- Enter descriptions for fields.
- Understand how to add fields.
- Understand how to enter various types of data into the table.

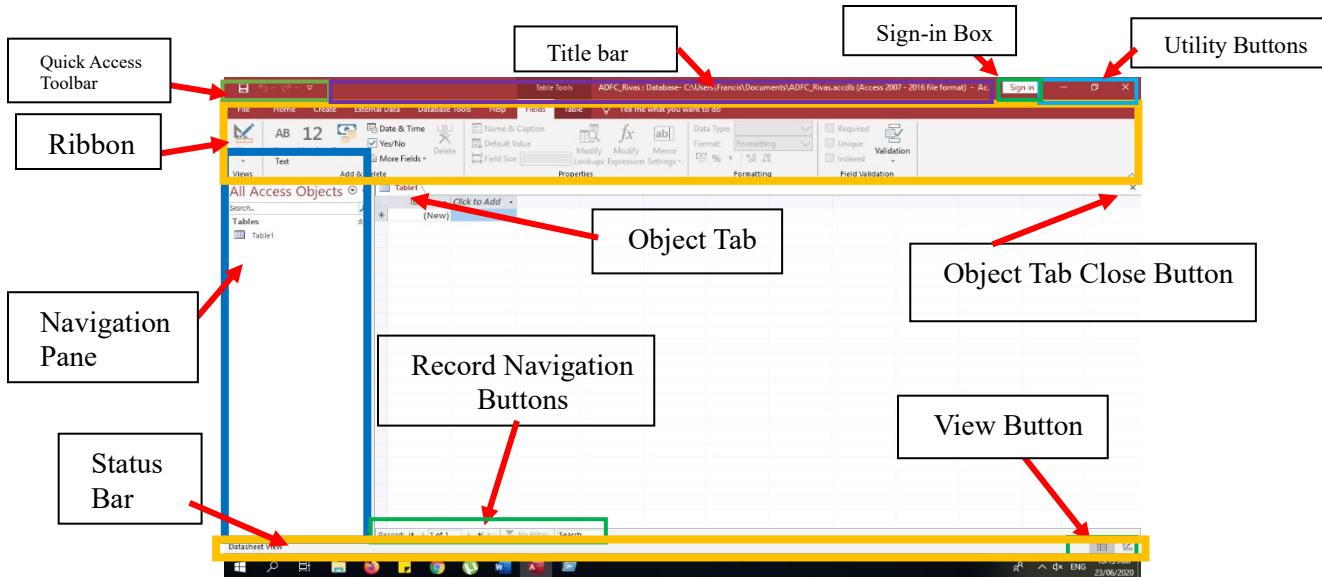
Creating a New Database

Follow the instruction in this activity and submit your output using our FB Group.



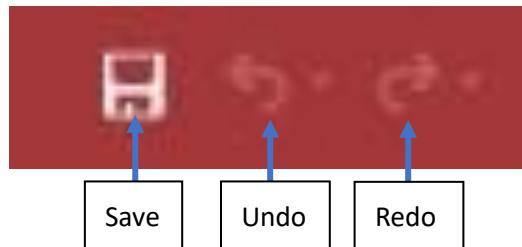


Then, Microsoft Access will display a **Database Window**, similar to the figure below:



The Quick Access Toolbar

The **Quick Access Toolbar** is a small toolbar that includes commonly used commands and is always accessible. By default, the Quick Access Toolbar is located in the top-left corner of Microsoft Access. By default, the Quick Access Toolbar includes three; the **Save** **Undo** and **Redo** commands.



1. **Save**. Click **Save** to save your document.
2. **Undo**. Click **Undo** to undo the action you last performed.
 - Click the drop-down arrow to the right of **Undo** to undo multiple actions at the same time.
3. **Redo**. Click **Redo** to repeat the action you last performed.

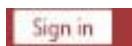
The Title Bar and Help Button

The title bar is always at the top of the program window and displays the name of the program and the current database you are working on. It also has three buttons at the right most side of it that allow you to minimize Access, maximize Access or close Access (from left to right) they also known as Utility Buttons.

The Sign-in Button

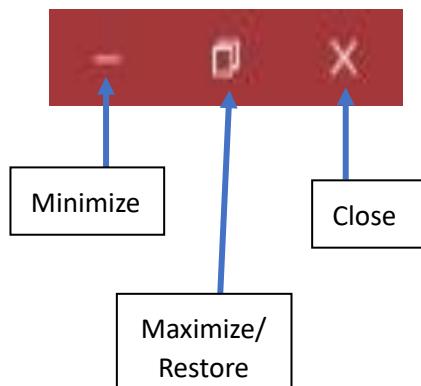


Located on the Title bar next to the Utility Buttons, it allows you to sign in to www.office.com from a web browser and start using the apps on the web or access other web services associated with your account such as OneDrive.



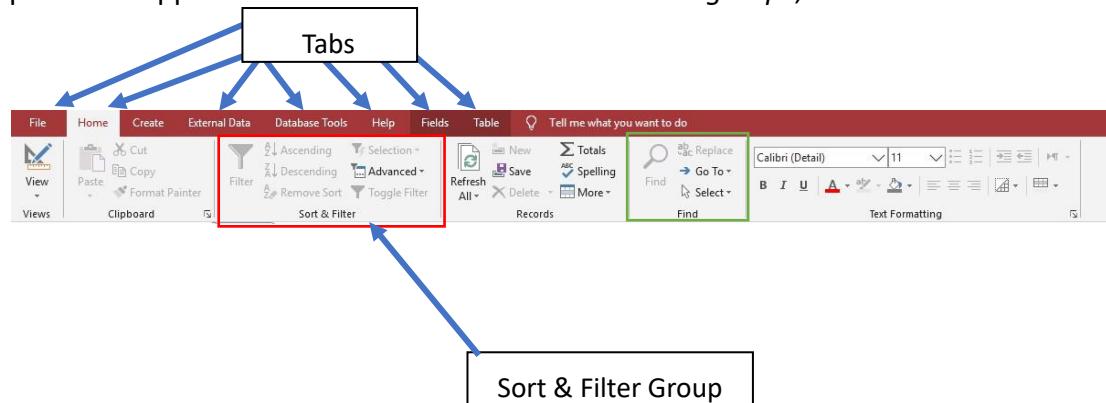
The Utility Buttons

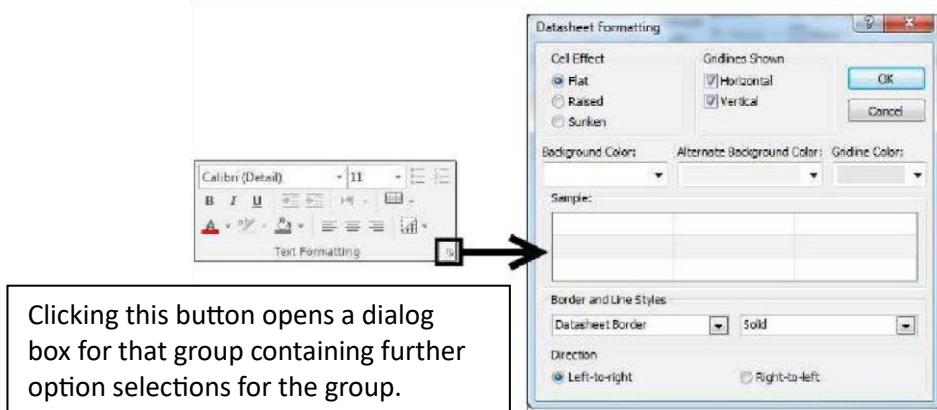
The **buttons in the upper-right corner** affect the size and position of the window. When you click **the maximize button**, the system enlarges the window to the size of the screen and positions the window, so it covers the entire desktop, minus the taskbar. At the same time, the system replaces **the maximize button with the restore button**. When you click **the restore button**, the system restores the window to its previous size and position. When you click **the minimize button**, the system reduces the window to the size of its taskbar button, positions the window over the taskbar button, and displays the taskbar button in its normal state. To restore the application to its previous size and position, click its taskbar button. When you click **the close button**, the application exits.



The Ribbon

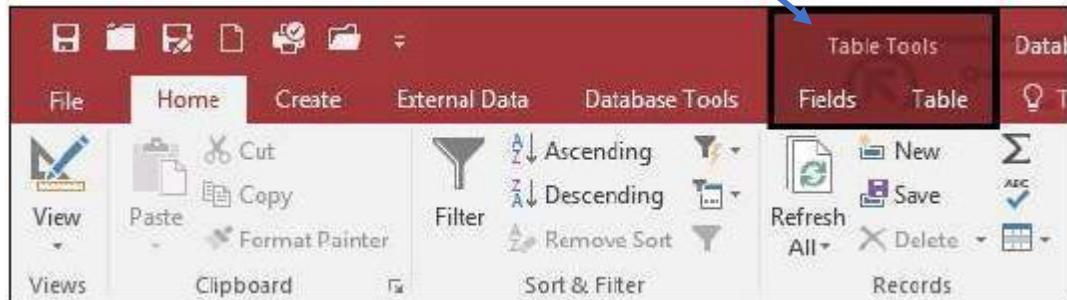
The *Ribbon* is a panel that contains groupings of buttons and drop-down lists organized by tabs. Each application in the Office Suite has a different set of tabs that pertain to the functionality of that particular application. Each tab is further divided into *groups*, such as the *Sort & Filter* and *Find* groups.





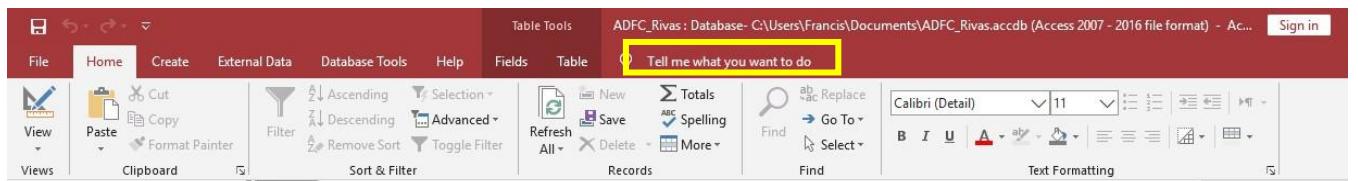
Clicking this button opens a dialog box for that group containing further option selections for the group.

Contextual tabs will appear depending on what you are working on. For example, if you are working in a table, the Table Tools tab appears.



The Tell Me

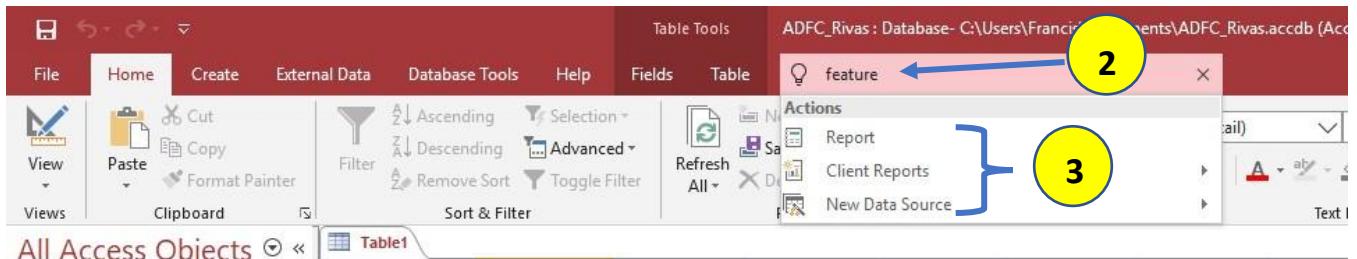
The Tell Me feature allows you to enter words and phrases related to what you want to do next to quickly access features or actions. It can also be used to look up helpful information related to the topic. It is located on the *Menu bar*, above the ribbon.



Get Help with Access/Search for Features

To receive Microsoft Access Help, either type in the *Tell Me* box or press the *F1* key on the keyboard.

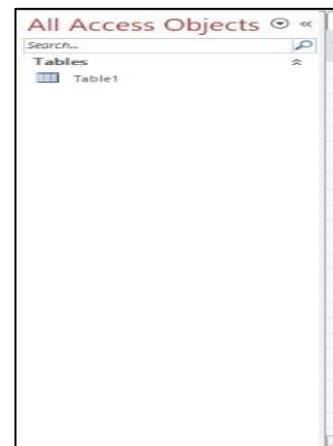
1. Click the **Tell Me** box.
2. Type the **question/ feature** you are looking for.
3. In the *Tell Me* drop-down, you will receive a list of *features* based on your search. Click the **Answer/Feature** you were looking for.



4. You will either be taken to the *feature* or a dialog box of that feature will open.

Navigation Pane

Looking for a way to track and manage your database objects? The Navigation Pane is the main way you view and access all your database objects and it displays on the left side of the Access window by default.



Common tasks

You can adjust the appearance of the Navigation Pane and work with database objects in the following ways:

| To | Do this |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open and close the Navigation Pane | Click the Shutter Bar Open/Close Button or press F11. If F11 doesn't work, make sure function keys (Fn) are enabled on your laptop device. Also, the F11 key is a Special Key and it may be disabled in your Access database. If the Navigation Pane is not visible, it may be turned off in your Access database. |
| Change the width of the Navigation Pane | Position the pointer over the right edge of the Navigation Pane and then, when it changes to a double-sided arrow , drag the edge to increase or decrease the width. |

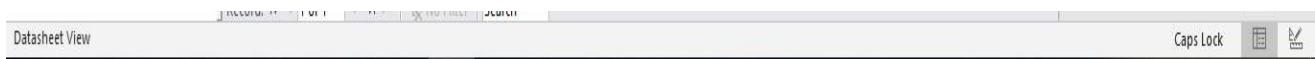
Open an object

By default, double-click the object.

| To | Do this |
|----------------------------------------------------------|-------------------------|
| Do other commands, such as open an object in Design view | Right-click the object. |

The Status Bar:

Status bar displays information while the user is working on an object within a database. NUM shows whether the Num Lock button is on or not. CAPS shows whether Caps Lock is on or not.



The View Buttons

This is located at the right side of the Status. It allows you to switch between the Datasheet and Design View of an active table.



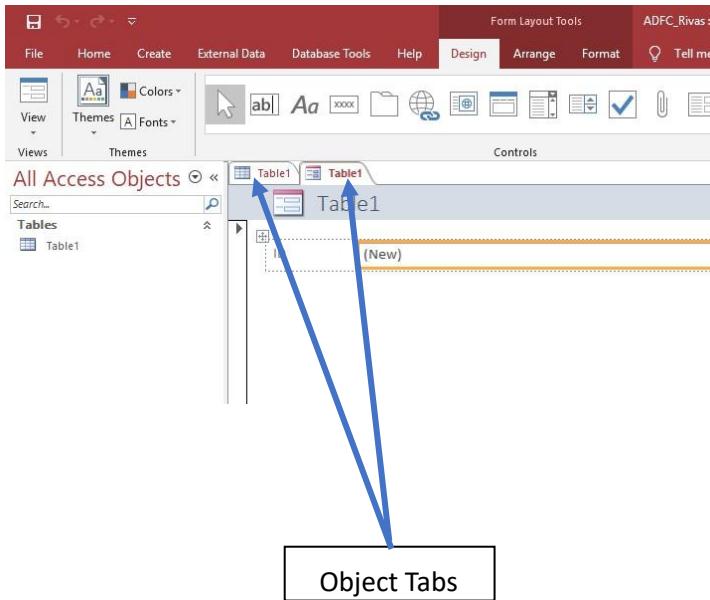
The Record Navigator

Allows you to move from one record to another in table datasheet and form view.



Object Tab

Object Tab is used to move between access objects.



Creating A Microsoft Access Table

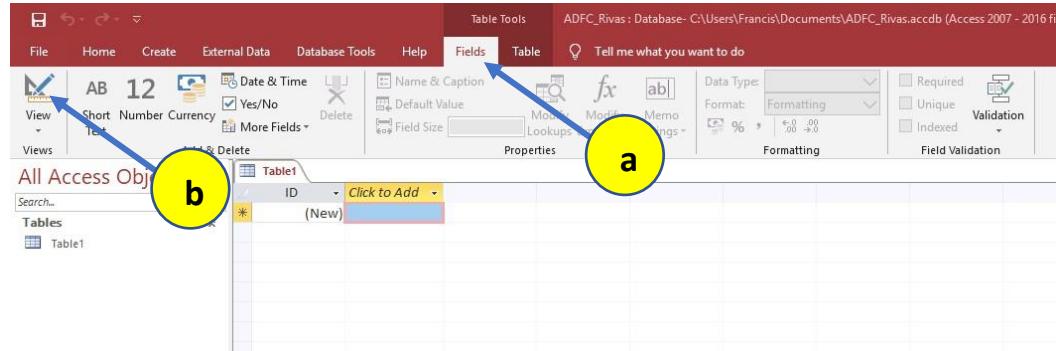
Table

Table is an object that is used to define and store data arranged in rows (records) and columns (fields). When you create a new table, Access asks you to define fields which is also known as column headings.

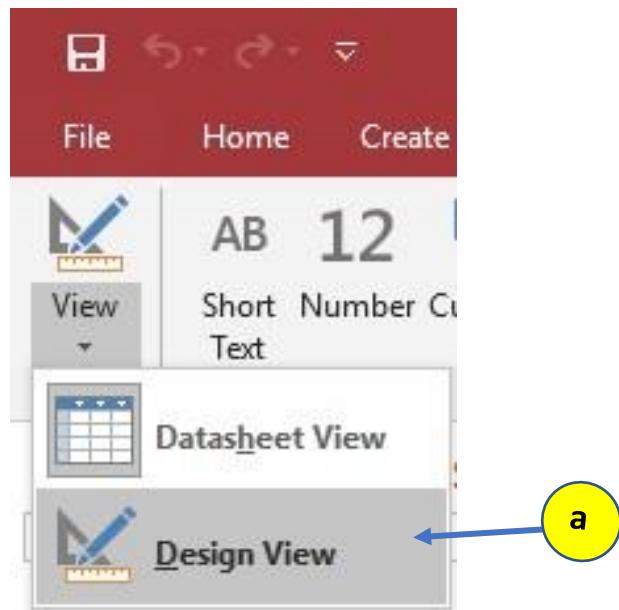
- Each field must have a unique name, and data type.
- Tables contain fields or columns that store different kinds of data, such as a name or an address, and records or rows that collect all the information about a particular instance of the subject, such as all the information about a customer or employee etc.
- You can define a primary key, one or more fields that have a unique value for each record, and one or more indexes on each table to help retrieve your data more quickly.

Upon creating a database, it is recommended that you create a table that will house relevant data. The following instructions explain how to create a table within your database.

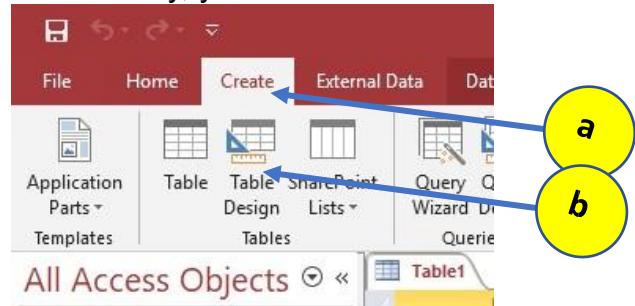
1. While you are in the Database Window, from the *Fields* tab under *Table Tools*, click on the **View** button.



Note: Clicking the **arrow** below the *View* button will display a drop-down menu with available views, click design view.

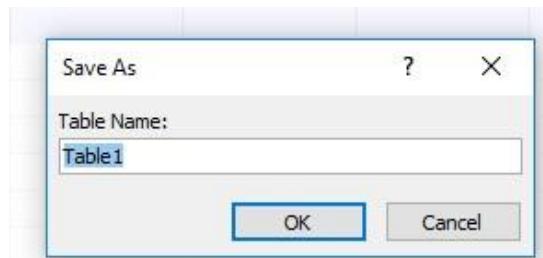


Alternatively, you can also click *Create Tab* from the Ribbon, then select *Table Design*



1. If you choose the first option above, the *Save As* window will open, prompting you to name your table. Enter the **name** of the table that you are about to create under *Table*

Name. In this activity, let us assume that we are interested to collect the student's information since we are very familiar to this, so let us name our table with "tblStudent", then click "OK".



General Rules for Names (Database, Tables, Field, Queries, Forms...)

These suggestions apply to the drawing up of any name:

- Names can be a combination of letters and numbers but always start with letters, like "address1", "Address2" ○ Description Give an object a name that is descriptive of its purpose or function (ex. For the field "First Name" you can use "fName" or "FirstName" don't just use "xxxx"). ○ Brevity Keep a name as short as possible without detracting from its descriptiveness ○ Mix Case Use a mix of upper and lower case characters in pursuit of deceptiveness ○ Capitals Avoid names spelt entirely in capitals ○ Lower Case Characters Avoid names spelt entirely in lower case characters ○ Plurals I avoid them. If you're going to use them, then apply them consistently ○ Spaces Don't use them in names ○ Wildcard characters like (_ , {, }, >, < ...) Don't use them in any name.

2. The *Design view* will open and display the *Field Names* and *Data Types* for the current table. Enter in the appropriate **Field Names** and **Data Types** (e.g. First name, Last name, etc.). The following explains the different data types that could be used for the table:
 - a. **AutoNumber** - The database will create a unique number for each record that is entered.
 - b. **Short Text** - Use for fields that contain letters and numbers. This option can contain up to 255 characters.
 - c. **Long Text** - Use for fields requiring long entries. Both letters and numbers can be created in this field. This option can hold up to 65,536 characters.
 - d. **Number** - Used when calculable numbers will be required for the field.
 - e. **Date/Time** - Select this choice when you need to enter a date or time.
 - f. **Currency** - Used when currency needs to be entered into the field.
 - g. **Yes/No** - Used when the field requires a yes or no entry. Appears as a check-box in the *Datasheet*.
 - h. **OLE Object** - Allows for the embedding and linking of a number of supported file types (e.g.

PDF, PowerPoint, Excel, Word, and Visio documents, and image and sound clips

- i. **Hyperlink** - Use when email addresses and hyperlinks are required
- j. **Attachment** - This option allows the user to attach one or more files to the record

- k. **Lookup (not displayed)** - This option helps the user create a drop-down list for the field. When this option is selected, the *Lookup Wizard* will begin

Now let us add fields to our table (Note: You can use [tab key] or [left and right arrow keys] to move the cursor to another column).

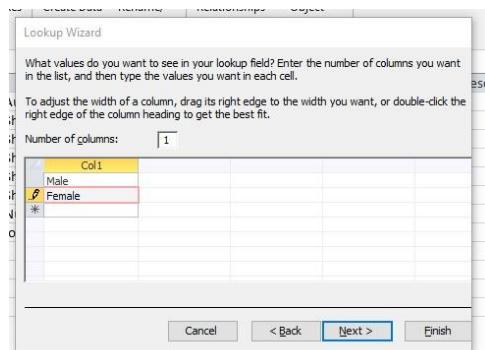
| Data | Fieldname | Data Type |
|------------------------|-----------|------------|
| Student ID No. | StudID | AutoNumber |
| Last Name | LName | Short Text |
| First Name | FName | Short Text |
| Middle Name Initial | MI | Short Text |
| Address | Address | Short Text |
| Birth Date | BDay | Date/Time |
| Age | Age | Number |
| Gender | Gender | Lookup |
| Course | Course | Short Text |
| Year Level | YrLevel | Number |

For Lookup Wizard Field, like “Gender”:

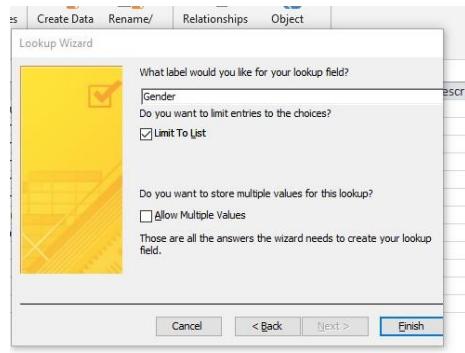
1. After you type the Lookup Wizard...Data Type Press the Enter Key.
2. Select “I will type in the values that I want”. Then Click Next



3. Type “Male” and “Female” under Col1.



4. Click Next.
 5. Click on the Limit To List Check Box (We want to Limit the Value to be entered based on what we have entered in the previous screen, “Male/Female” only.



6. Click Finish button, then Microsoft access will display the appropriate data type based on inputted values in the list.

This will be the result of the table defined on the previous page.

| Field Name | Data Type | Description (Optional) |
|------------|------------|------------------------|
| StudID | AutoNumber | |
| LName | Short Text | |
| FName | Short Text | |
| MI | Short Text | |
| Address | Short Text | |
| BDay | Date/Time | |
| Age | Number | |
| Gender | Short Text | |
| Course | Short Text | |
| YrLevel | Number | |

Things to Remember When Creating a Table

It is important to remember the following when creating a table.

Primary Key

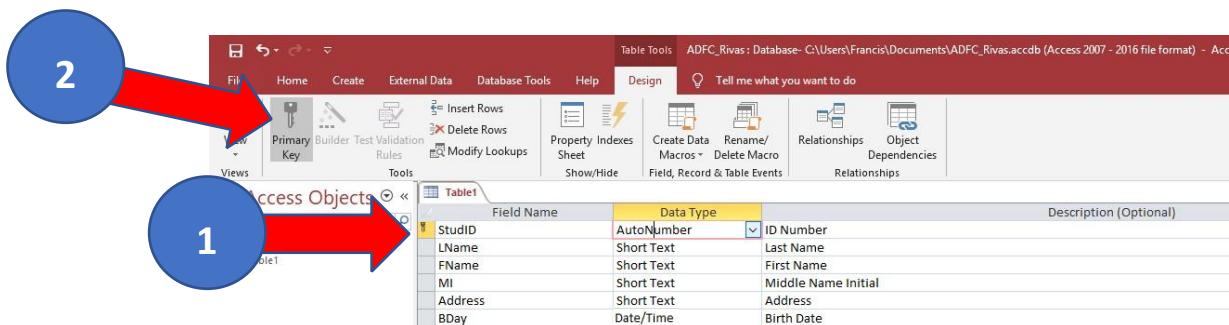
Records in Access can be organized by a unique, identifying number. The primary key is used to ensure that no two records have the same number. For example, in the table created for student information, it is important that each student has a unique *Student ID*.

| Field Name | Data Type | Description (Optional) |
|------------|------------|------------------------|
| StudID | AutoNumber | ID Number |
| LName | Short Text | Last Name |
| FName | Short Text | First Name |
| MI | Short Text | Middle Name Initial |
| Address | Short Text | Address |
| BDay | Date/Time | Birth Date |
| Age | Number | Age |

The primary key can be used with the following data types: *Auto Number, Number, and Text*.

The primary key can be toggled on/off by clicking on the **Primary Key** button located on the *Design* tab.

Now, Click on the StudID



When the *Primary Key* is active, it will appear as a key icon to the left of the field name.

| Field Name | Data Type | Description (Optional) |
|------------|------------|------------------------|
| StudID | AutoNumber | ID Number |
| LName | Short Text | Last Name |
| FName | Short Text | First Name |
| MI | Short Text | Middle Name Initial |
| Address | Short Text | Address |
| BDay | Date/Time | Birth Date |
| Age | Number | Age |

Set the Field Size

You can adjust the amount of space that each record in an Access table uses by changing the field size property of number fields in the table. You can also change the field size of a field that stores text data, although this action has a smaller effect on the amount of space that is used.

What happens when I change the field size?

You can change the field size of a field that is empty or that already contains data. The effect of changing the field size depends on whether the field already contains data.

- **If the field does not contain data** When you change the field size, the size of new data values is limited for the field. For number fields, the field size determines exactly how much disk space Access uses for each value of the field. For text fields, the field size determines the maximum amount of disk space that Access allows for each value of the field.
- **If the field contains data** When you change the field size, Access truncates all the values in the field that exceed the specified field size, and also limits the size of new data values for the field, as described above.

Change the field size of a number field

1. In the Navigation Pane, right-click the table that contains the field that you want to change, and then click **Design View**.
2. In the table design grid, select the field for which you want to change the field size.
3. In the **Field Properties** pane, on the **General** tab, enter the new field size in the **Field Size** property. You can choose from the following values:
 - **Byte** — For integers that range from 0 to 255. Storage requirement is a single byte.
 - **Integer** — For integers that range from -32,768 to +32,767. Storage requirement is two bytes.
 - **Long Integer** — For integers that range from -2,147,483,648 to +2,147,483,647. Storage requirement is four bytes.

Tip: Use the Long Integer data type when you create a foreign key to relate a field to another table's AutoNumber primary key field.

- **Single** — For numeric floating point values that range from -3.4 x 1038 to +3.4 x 1038 and up to seven significant digits. Storage requirement is four bytes.
- **Double** — For numeric floating point values that range from -1.797 x 10308 to +1.797 x 10308 and up to 15 significant digits. Storage requirement is eight bytes.
- **Replication ID** — For storing a GUID that is required for replication. Storage requirement is 16 bytes.

Note: Replication is not supported using an .accdb file format.

- **Decimal** — For numeric values that range from -9.999... x 1027 to +9.999... x 1027. Storage requirement is 12 bytes.

Let us change the Field Size of our Student Table Fields (example “LName”). We knew that there's no last name longer than 20 characters. So, let us set the Field Size

The screenshot shows the 'Table1' properties window. At the top, there is a table structure with columns for 'Field Name', 'Type', and 'Description'. The 'LName' row is highlighted. A large blue circle labeled '1' is placed over the 'Type' column header. A red arrow points from this circle to the 'Type' column of the table, indicating where to click. Below the table, the 'Field Properties' section is expanded, showing various settings like 'Format' (set to 255). A large blue circle labeled '2' is placed over the 'Format' setting. A red arrow points from this circle to the 'Format' input field, indicating where to click and change the value.

| Field Name | Type | Description |
|------------|------------|---------------------|
| StudID | AutoNumber | ID Number |
| LName | Short Text | Last Name |
| FName | Short Text | First Name |
| MI | Short Text | Middle Name Initial |
| Address | Short Text | Address |
| BDay | Date/Time | Birth Date |
| Age | Number | Age |
| Gender | Short Text | Gender |
| Course | Short Text | Course |
| YrLevel | Number | Year Level |

Field Properties

General Lookup

Field Size: 255

Format

Input Mask

Caption

Default Value

Validation Rule

Validation Text

Required: No

Allow Zero Length: Yes

For Short Text Data Types

1. Click on the LName Field Name or anywhere on the LName row.
2. Click on Field Size the change 255 to 20.

Note: Change also the field size of all short text data type to their appropriate size.

The screenshot shows the 'Table1' properties window. The 'Age' row is highlighted. A large blue circle labeled '1' is placed over the 'Data Type' column header. A red arrow points from this circle to the 'Data Type' column of the table, indicating where to click. Below the table, the 'Field Properties' section is expanded, showing the 'Format' setting. A large blue circle labeled '2' is placed over the 'Format' dropdown menu. A red arrow points from this circle to the dropdown menu, indicating where to click to open it. A third blue circle labeled '3' is placed over the 'Format' input field, indicating where to click to change the value.

| Field Name | Data Type | Description |
|------------|------------|-------------|
| BDay | Short Text | |
| Age | Number | Age |
| Gender | Short Text | Gender |
| Course | Short Text | Course |
| YrLevel | Number | Year Level |

Field Properties

General Lookup

Field Size: Single

Format: Byte

Input Mask

Caption

Default Value

Validation Rule

Validation Text

Required: No

Indexed: No

Text Align: General

The size and type of numbers to enter in the field. The most common settings are Double and Long Integer. If this field will be joined to an AutoNumber field in a many-to-one relationship, this setting must be Long Integer.

For Numeric Data Types

1. Click on the Age Field Name or anywhere on the age row.
2. Click on the drop-down button located at the right side of the field size.

3. Select **Byte**, since byte can hold a maximum of 255 integer values it is the smallest field size for numbers and we are sure there's no student's age beyond 255 years old.

Note: Change also the field size of all short text data type to their appropriate size.

Error Traps

Error traps help to make certain that correct data is entered into the database by users. With an error trap, we can have an error message appear in the event that incorrect data is entered. For example, for the field “course”, we want to limit only values that can be entered to “BSCE, BSCOE, BSCS, BSIT, BSA, BSBA,BSED, BEED, BSCRIM, BSHRM, and BSTM” course. The following explains how to create an error trap for this field.

1. Click to select the Short Text field **course**.
2. Click on the Validation Rule Property under general Tab. To make certain that the user enters only “BSCE, BSCOE, BSCS, BSIT, BSA, BSBA,BSED, BEED, BSCRIM, BSHRM, and BSTM, Enter/type “BSCE” or “BSCOE” or “BSCS” or “BSIT” or “BSA” or “BSBA” or “BSED” or “BEED” or “BSCRIM” or “BSHRM” or “BSTM” with double quotes before and after the course.

| Table1 | | Field Name | Data Type | Description (Optional) |
|---------|------------|------------|-----------|------------------------|
| BDay | Short Text | Birth Date | | |
| Age | Number | Age | | |
| Gender | Short Text | Gender | | |
| Course | Short Text | | | |
| YrLevel | Number | | | |

| | |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| General | Lookup |
| Field Size | 255 |
| Format | |
| Input Mask | |
| Caption | |
| Default Value | |
| Validation Rule | \"BSCE\" Or \"BSCOE\" Or \"BSCS\" Or \"BSIT\" Or \"BSA\" Or \"BSBA\" Or \"BSED\" Or \"BEED\" Or \"BSCRIM\" Or \"BSHRM\" Or \"BSTM\" |
| Validation Text | |
| Required | No |
| Allow Zero Length | Yes |
| Indexed | No |
| Unicode Compression | Yes |
| IME Mode | No Control |
| IME Sentence Mode | None |
| Text Align | General |

For Numeric Field like **YrLevel**, we want the user to enter values 1 – 5 which means first year to fifth year.

1. Click on the YrLevel Field.
2. Click on the Validation Rule Property and type “>=1 and <=5” without the double quote.

The screenshot shows the 'Field Properties' dialog for a table named 'Table1'. The 'General' tab is selected. A red arrow points from a blue circle labeled '1' to the 'Validation Rule' field, which contains the value ' $>=1$ and $<=5$ '. Another red arrow points from a blue circle labeled '2' to the 'Validation Text' field, which contains the value 'Invalid Entry! Please enter an integer from 1 to 5.'

| Field Name | Data Type | Description |
|------------|------------|-------------|
| Age | Number | Age |
| Gender | Short Text | Gender |
| Course | Short Text | Course |
| YrLevel | Number | Year Level |

| General | Lookup |
|-----------------|-----------------------------------------------------|
| Field Size | Byte |
| Format | |
| Decimal Places | Auto |
| Input Mask | |
| Caption | |
| Default Value | |
| Validation Rule | $>=1$ and $<=5$ |
| Validation Text | Invalid Entry! Please enter an integer from 1 to 5. |
| Required | No |
| Indexed | No |
| Text Align | General |

Add Validation Text to all fields containing a validation rule to make your application a user-friendly (easy to understand by the user).

Whatever appears in the *Validation Text* field is the message that will appear if a user attempts to enter data that violates the *Validation Rule* that was entered in Step 2. For example, the following is an example of a message that could be entered: **Invalid Entry! Please enter an integer from 1 to 5.**

The screenshot shows the 'Field Properties' dialog for a table named 'Table1'. The 'General' tab is selected. A red arrow points from a blue circle to the 'Validation Rule' field, which contains the value ' $>=1$ And $<=5$ '. Another red arrow points from a blue circle to the 'Validation Text' field, which contains the value 'Invalid Entry! Please enter an integer value ranging from 1 to 5.'

| Field Name | Data Type | Description (Optional) |
|------------|------------|------------------------|
| Age | Number | Age |
| Gender | Short Text | Gender |
| Course | Short Text | Course |
| YrLevel | Number | Year Level |

| General | Lookup |
|-----------------|-------------------------------------------------------------------|
| Field Size | Byte |
| Format | |
| Decimal Places | Auto |
| Input Mask | |
| Caption | |
| Default Value | |
| Validation Rule | $>=1$ And $<=5$ |
| Validation Text | Invalid Entry! Please enter an integer value ranging from 1 to 5. |
| Required | No |
| Indexed | No |
| Text Align | General |

Descriptions

The *Description* column is a place where you can provide instructions to users who will be entering data into the table.

The following explains how to create a *description* for a field.

1. Place your **cursor** in the *Description* column next to the field of your choice, example **LName**.
2. Enter a **description**

| Field Name | Data Type | Description (Optional) |
|------------|------------|---------------------------------------|
| StudID | AutoNumber | |
| LName | Short Text | Please enter the student's last name. |
| FName | Short Text | |
| MI | Short Text | |
| Address | Short Text | |

Adding/Inserting Fields

Once the table has been completed for the database, it is possible to add fields to the datasheet. The following explains how to add a new field for *Status* between *gender* and *course*.

| Field Name | Data Type | Description (Optional) |
|------------|------------|---------------------------------------|
| StudID | AutoNumber | |
| LName | Short Text | Please enter the student's last name. |
| FName | Short Text | |
| MI | Short Text | |
| Address | Short Text | |
| BDay | Date/Time | |
| Age | Number | |
| Gender | Short Text | |
| Course | Short Text | |
| YrLevel | Number | |

1. Right-click **course** field.
2. A *context sensitive* menu will appear. Click **Insert Rows**.

Table1

| Field Name | Data Type | Description |
|------------|------------|---------------------------------------|
| StudID | AutoNumber | |
| LName | Short Text | Please enter the student's last name. |
| FName | Short Text | |
| MI | Short Text | |
| Address | Short Text | |
| BDay | Date | |
| Age | Number | |
| Gender | Short Text | |
| Course | Short Text | |
| YrLevel | Number | |

A screenshot of Microsoft Access showing the design view of Table1. A context menu is open over the 'Course' field, with the 'Insert Rows' option highlighted. Red arrows point from two numbered circles (1 and 2) to the 'Insert Rows' button and the menu itself. The menu also includes options like Primary Key, Cut, Copy, Paste, Delete Rows, and Properties.

Table1

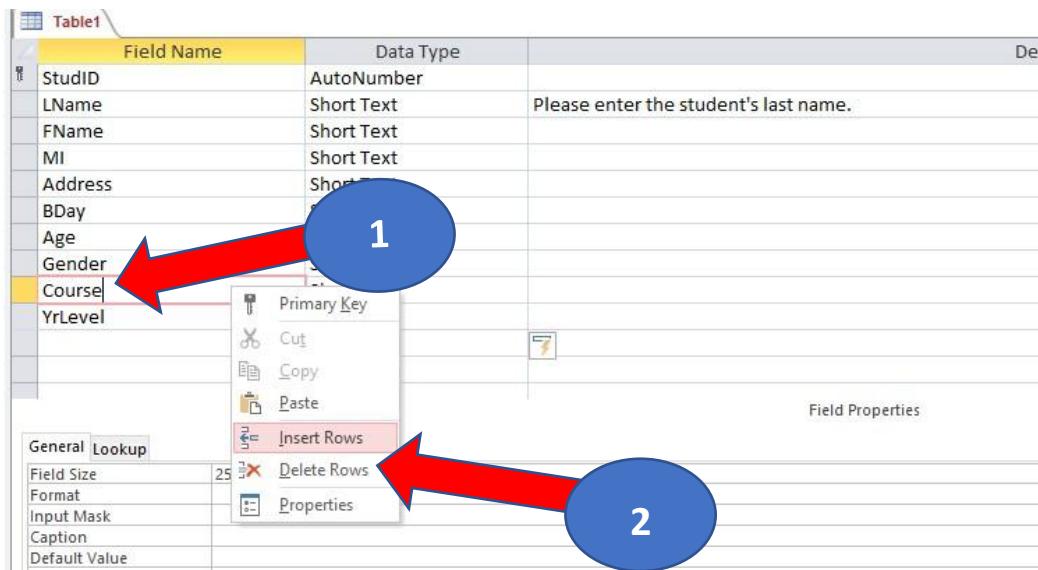
| Field Name | Data Type | Description |
|------------|------------|---------------------------------------|
| StudID | AutoNumber | |
| LName | Short Text | Please enter the student's last name. |
| FName | Short Text | |
| MI | Short Text | |
| Address | Short Text | |
| BDay | Date | |
| Age | Number | |
| Gender | Short Text | |
| Status | Short Text | |
| Course | Short Text | |
| YrLevel | Number | |

A screenshot of Microsoft Access showing the design view of Table1. The 'Status' field has been successfully inserted after the 'Gender' field. A red arrow points from a blue circle labeled '2' to the 'Status' field. The table structure now includes fields: StudID, LName, FName, MI, Address, BDay, Age, Gender, Status, Course, and YrLevel.

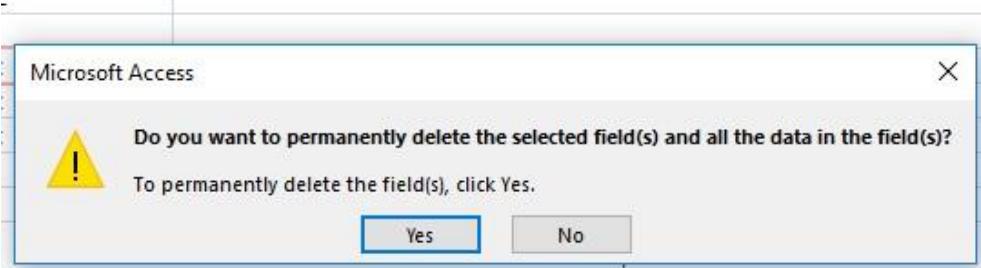
Note: Add a validation rule and text, description, and change the field size of the new inserted column.

Deleting Field

1. Right-click the field you want to delete.
2. A *context sensitive* menu will appear. Click **Delete Rows**.



3. A confirmation window appears. Click Yes if you want to delete, otherwise No.
In this Activity you just Click No.



Default Values

As the database designer, you have the option of including *Default Values*. For example, in the table below, suppose that 75% of the entries for *YrLevel* will be 1. You could include a default value of 1 to make data entry easier for the user.

The following explains how to include the default value of 1 for the *YrLevel*.

1. Select the **YrLevel** field.
2. Enter 1 on the **Default Value Property**.

| Field Name | Data Type | |
|------------|------------|---------------------------------------|
| StudID | AutoNumber | |
| LName | Short Text | Please enter the student's last name. |
| FName | Short Text | |
| MI | Short Text | |
| Address | Short Text | |
| BDay | Date/Time | |
| Age | Number | |
| Gender | Short Text | |
| Status | Short Text | |
| Course | Short Text | |
| YrLevel | Number | |

Field Properties

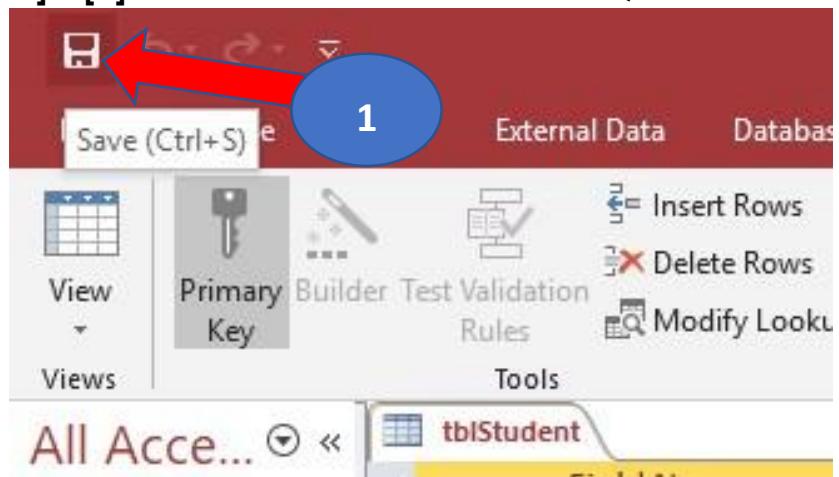
General Lookup

| | |
|-----------------|----------------------------------------------------------|
| Field Size | Byte |
| Format | |
| Decimal Places | Auto |
| Input Mask | |
| Caption | |
| Default Value | 1 |
| Validation Rule | >=1 And <=5 |
| Validation Text | Invalid Entry! Please enter a value ranging from 1 to 5. |
| Required | No |
| Indexed | No |
| Text Align | General |

Note: Add a default value to some other fields.

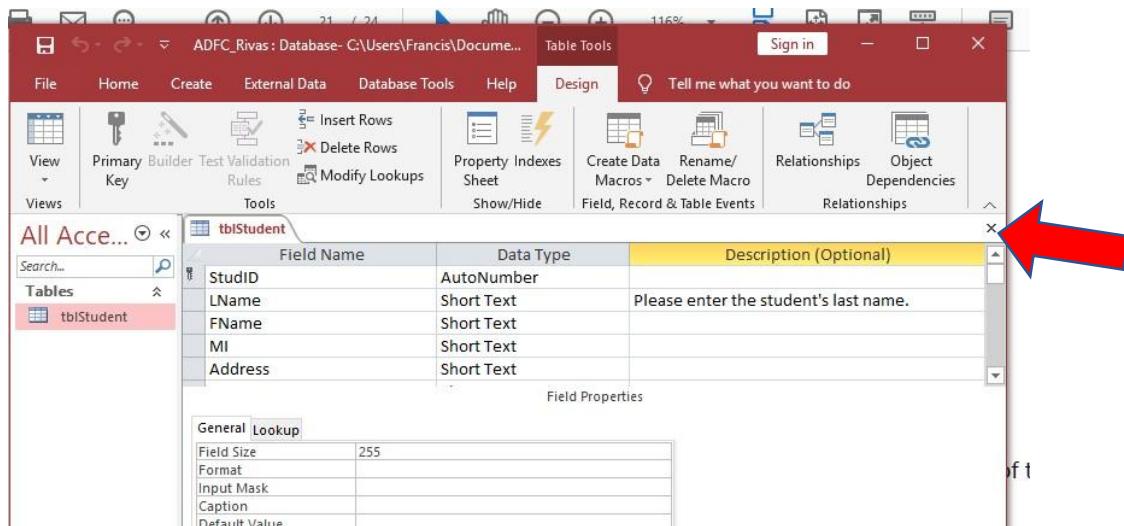
Saving Changes of the Current Table.

1. Press [Ctrl] + [S] or click the Save Button on the Quick Access Toolbar



Opening and Closing the Table

When you are finished creating the table, it can be closed by clicking the X in the upper-right corner of the table.



To open the table again, double-click the **name of the table** that you want to open. The name of the table will appear on the left area of the window called **Navigation Pane**.

The screenshot shows the Microsoft Access application in Design View. The ribbon at the top has 'Table Tools' selected. The 'Design' tab is active, showing icons for Insert Rows, Delete Rows, Modify Lookups, Property Sheet, Create Data, Rename/Macros, Relationships, and Dependencies. Below the ribbon is a table named 'tblStudent'. The table has four columns: 'Field Name', 'Data Type', and 'Description (Optional)'. It contains three rows with fields: 'StudID' (AutoNumber), 'LName' (Short Text), and 'Address' (Short Text). A red arrow points to the 'tblStudent' entry in the Navigation Pane on the left.

Entering Data into the Table

Opening a table will display the *Datasheet* view. Once open, you can begin entering data into the table. The following explains how to enter data into your table:

1. Click on the first blank cell.

The screenshot shows the Microsoft Access application in Datasheet view. The ribbon at the top has 'Table Tools' selected. The 'Fields' tab is active, showing icons for Filter, Sort & Filter, Refresh, Find, and Text Formatting. Below the ribbon is a table named 'tblStudent'. The first row is highlighted in yellow and contains the text '(New)'. A red arrow points to the first cell of this row. The table has ten columns: StudID, LName, FName, MI, Address, BDay, Age, Gender, Status, and Course.

2. Begin typing your data into the cell. When finished typing your data into the cell, press the Tab key on your keyboard to move right to the next cell.
3. Continue entering data into the cells.

For cells that use the *Date/Time* data type:

4. Click on the **appropriate cell**. The *Calendar icon* will appear next to the cell. Click Calendar Icon.

| StudID | LName | FName | MI | Address | BDay | Age | Gender | Status | Course | YrLevel | Click |
|--------|-----------|--------|----|--------------|------|-----|--------|--------|--------|---------|-------|
| 1 | Magayones | Julius | R | Dulag, Leyte | 0 | 0 | | | | 1 | |
| * | (New) | | | | | | | | | 1 | |

The *Calendar* will appear. Select the appropriate **date** or manually **type** the date into the cell.

| Su | Mo | Tu | We | Th | Fr | Sa |
|----|----|----|----|----|----|----|
| 31 | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |

For cells that use a *Lookup Value* data type:

5. Click on the **appropriate cell**. A *dropdown arrow* will appear. Select the appropriate **Lookup Value**.

| |
|--------|
| Male |
| Female |

6. For cells that have *Default Values*, you will see data pre-populate the cell. You may leave the data as is or enter different data as needed.

For other Data Types not in this Activity

For cells that use the *Yes/No* data type:

7. Click on the **checkbox** to indicate the *yes/no* value. A checked box indicates a *Yes* value. An un-checked box indicates a *No* value.

For cells that use the *Currency* data type:

8. Simply enter the **value**. Your number will automatically be entered as currency.

Add at least ten (10) records to your table named “tblstudent.” Then, watch and practice the content in the attached videos (1-10). Using your answer from Lesson 3 #4, create your own database and table(s), and add at least 10 records to each table before submitting your database files to:

e-mail: iteach.adfc@gmail.com

Subject: YOURLASTNAME_YOURFIRSTNAME_MCIS_ASS3_JAN2026

Deadline: January 18, 2026