Introduction to Microsoft Access 2013

A database is a collection of information that is related.

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

Access allows you to manage your information in one database file. Within Access there are four major objects: **Tables, Queries, Forms** and

Reports.

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.

Forms

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.

Reports

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.

Architecture of MS. Access

1. 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.

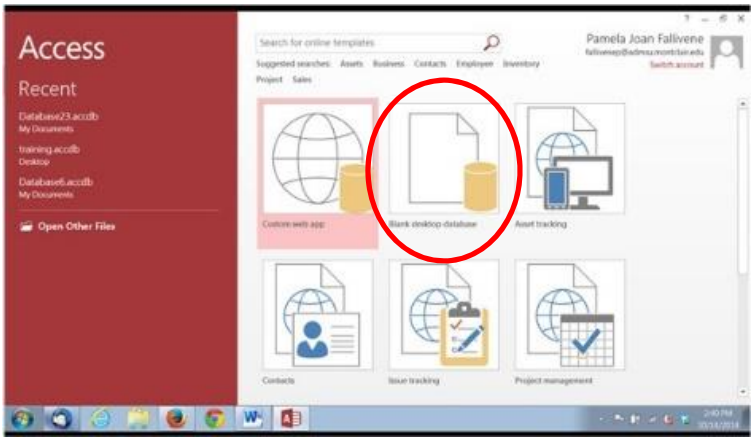
2. If you have worked with other database systems on desktop computers, you might have seen the term database used to refer to only those files in which you store data.
3. But, in Access, a desktop database (.accdb) also includes all the major objects related to the stored data, including objects you define to automate the use of your data. Before MS Access 2007, the file extension was ***.mdb**, but in MS Access 2007 the extension has been changed to ***.accdb** extension.
4. Early versions of Access cannot read accdb extensions but MS Access 2007 and later

versions can read and change earlier versions of Access.

5. An Access desktop database (.accdb or .mdb) is a fully functional RDBMS.

Creating a Database

1. Start **Access**
2. Click on **Blank desktop database**
3. Under **File Name** type a name for the database
4. To change the location of where to store the database, click the folder icon and select alocation
5. Click **Create**



Access opens in a new table in **Datasheet View**.

Understanding Views

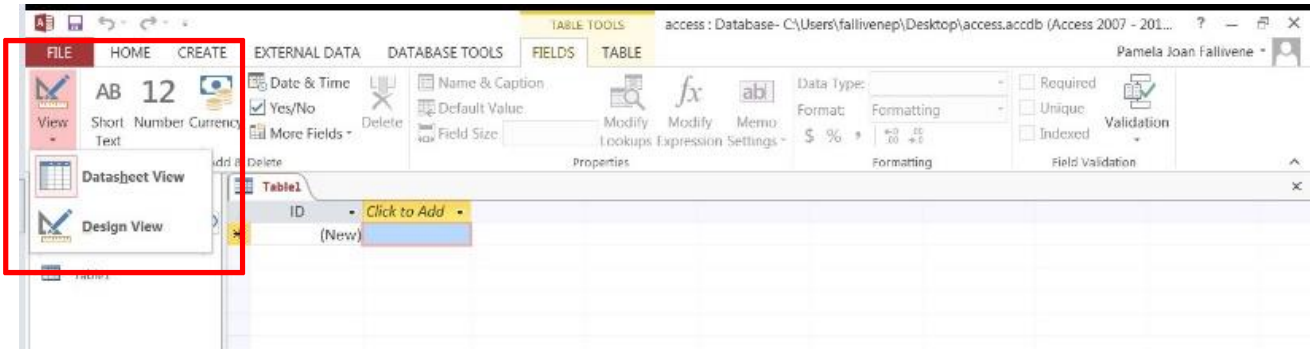
There are multiple ways to view a database object. The two views for tables are **Design View** and

Datasheet View.

- **Design View** is used to set the data types, insert or delete fields, and set the Primary Key
- **Datasheet View** is used to enter and view the data for the records

Switching Between Design View and Datasheet View:

Click the **View** arrow on the **Home** tab and click on either **Datasheet View** or **Design View**

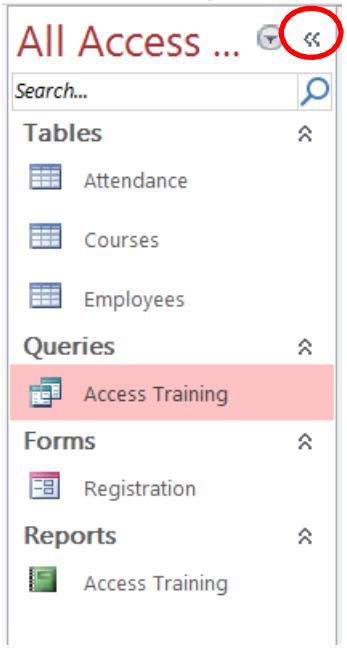


The Navigation Pane

The **Navigation Pane** is a list containing every object in your database. For easier viewing, the objects are organized into groups by type. You can **open**, **rename**, and **delete** objects using theNavigation Pane.

To Minimize and Maximize the Navigation Pane:

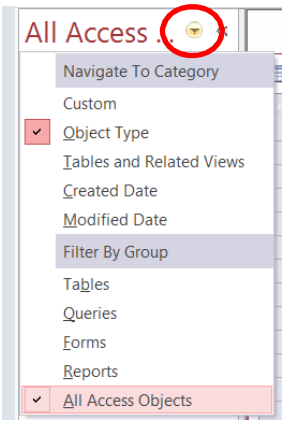
Click the **double arrow** « in the upper-right corner of the Navigation Pane to minimize andmaximize.



Sorting the Objects in the Navigation Pane:

By default, objects are sorted by type, with the tables in one group, the forms in another, etc.However, you can change how the objects are sorted.

Click the **drop-down arrow** to the right of the **All Access Objects** and click on a sort option fromthe list.



Creating a Table

A table is a collection of data about a specific topic, such as employee information, products or customers. The first step in creating a table is entering the fields and data types. This can be donein either Datasheet View or Design View but it is recommended to set up the table in **Design View.**

Understanding Fields and Their Data Types

Field - an element of a table that contains a specific item of information, such as a last name.

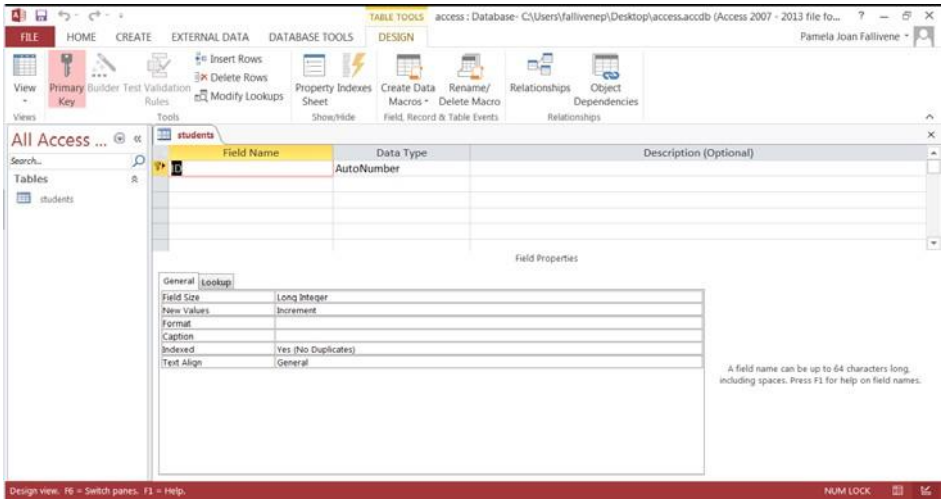
Field's Data Type - determines what kind of data the field can store.

Format	Use to display
Short Text	Alphanumeric data (names, titles, etc.) - up to 255 characters
Long Text	Large amounts of alphanumeric data: sentences and paragraphs – 64,000 characters
Number	Numeric data
Date/Time	Dates and times
Currency	Monetary values
AutoNumber	Unique value generated by Access for each new record
Yes/No	Yes and No values and fields that contain only one of two values
OLE Object	Pictures, graphs, or other ActiveX objects from another Windows-based application
Hyperlink	A link address to a document or file on the Internet
Attachment	You can attach files such as pictures, documents, spreadsheets, or charts; each Attachment field can contain an unlimited number of attachments per record, up to the storage limit of the size of a database file.
Calculated	You can create an expression that uses data from one or more fields. You can designate different result data types from the expression.
Lookup Wizard	Displays either a list of values that is retrieved from a table or query, or a set of values that you specified when you created the field. The Lookup Wizard starts and you can create a Lookup field. The data type of a Lookup field is either text or number, depending on the choices that you make in the wizard.

To Create a Table in Design View:

1. Click on the **Create** tab
2. Click on **Table**
3. Switch over to **Design View** on the **Home** tab
4. If prompted to save the table, enter a name and click on **OK**
5. Type the field names and select the appropriate data type for each field
6. Continue until all fields are added

Note: The order that you enter the field names is the order the fields will appear in the table.



Essential Keys in Access

1. Primary key
2. Foreign Key

Setting a Primary Key

The **Primary Key** is the unique identifier for each record in a table. Access will not allow duplicate entries in a primary key field. When creating a new table, Access automatically creates a field "ID" with the auto number data type, and assigns this as the Primary Key.

You can set your own primary key in Access, however, when doing so you need to consider the following;

1. The field you set to be your primary key should be unique for all data items in your database
2. The field should be caple of properly representing all the other data items. Such that with the

primary key I can easily know everything else

Example

Think of a database table that contains the following data about a student

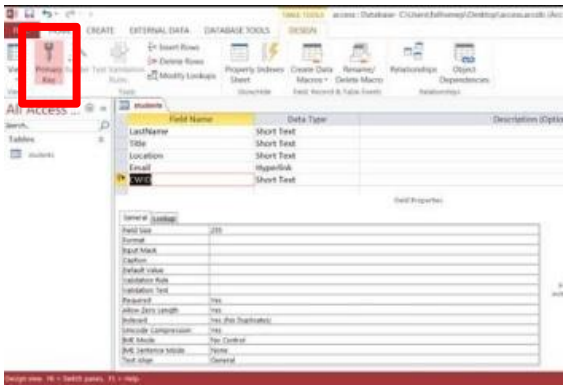
Student_RegNo	Name	Course_Code	Department	Home County
SC150 002 2020	Pascal Kimtai	SIT 050	IT	Kericho

In this case, the registration number would form a very good primary key since each student has a unique registration number. Also national ID number can equally be used.

To Set a Primary Key:

1. In **Design View**, position your cursor in the field you wish to set as the Primary Key
2. Click the **Primary Key** button on the toolbar
3. **Save** the table

Note: To turn off the Primary Key simply click on the Primary Key button again.



Foreign Key

Foreign key is used to generate the relationship between the tables. Foreign Key is a field in database table that is Primary key in another table. A foreign key can accept null and duplicate value.

Example

Now lets think of a department database table which contains the following details

DPT-Code	DPT-Name	Student_RegNo	Course_Code
SCIT/IT	IT	SC150 002 2020	SIT 050

In the above table, DPT-Code is the primary key of the table. Note that in that table there is a field

known as Student-RegNo. Now this field was the primary key of the students table. Therefore, since student and department table relate the Student_RegNo becomes the foreign key in the departments table.

Input mask

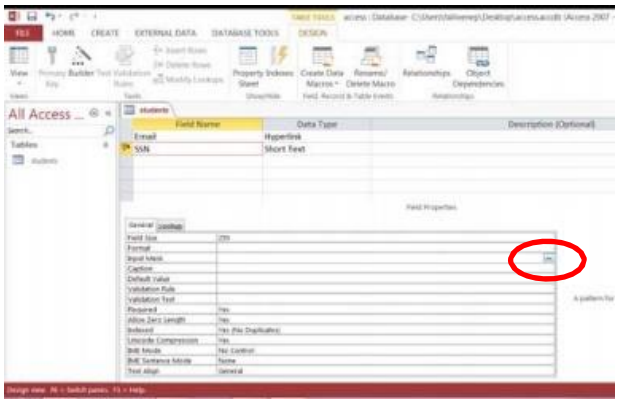
An **input mask** is used to pre-format a field to "look/act" a certain way when a user inputs data.

Examples: Social Security Number input mask automatically inserts the dashes; phone numbers automatically inserts the parentheses and dashes.

The input mask data can either be stored in the table or simply displayed and not stored.

To Create an Input Mask for a Field:

1. In **Design View**, click in a field for which you'd like to apply an input mask
2. In the **Field Properties** section at the bottom of the screen, click in the Input Mask line and notice the **Build** button that appears at the right end of the line (see below):



3. Click the **Build** button to start the Input Mask Wizard (shown below).

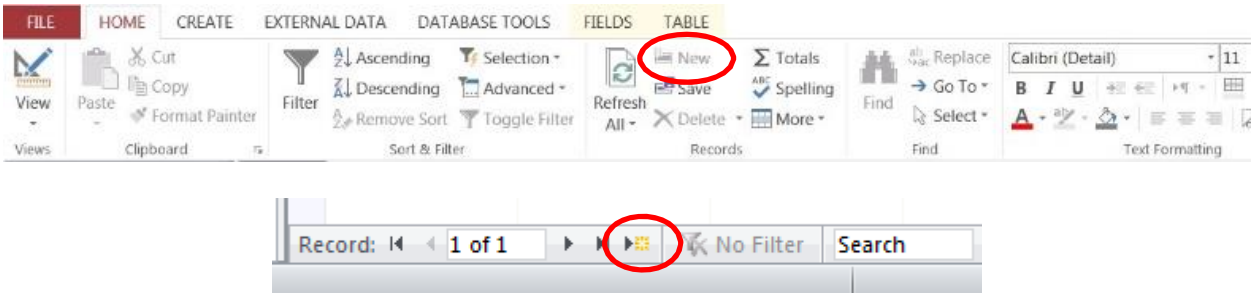
4. Select the appropriate input mask
5. Click **Next**
6. Click **Next** for additional screens on which you can set options for the input mask
7. Click **Finish** on the last screen of the input mask wizard

To Save the Table:

1. Click the **Save** icon on the toolbar
2. Enter a name for the table if you haven't done so already
3. Click **OK**

Entering Data in a Table

1. In **Datasheet View**, start typing the data into the table by pressing the tab key to move to the next cell
2. When you have completed the record (row), press **Enter**
3. You can also click on the **New record** icon on the **Home** tab in the **Records** group or at the bottom of the table



Navigating in a Table

Use the arrows at the bottom of the table to navigate among records.

Sorting Records in a Table

1. Position your cursor in the field that you wish to sort by clicking on any record in the table
2. Click either the **Sort Ascending** or **Sort Descending** icon on the **Home** tab in the **Sort &**

Filter group

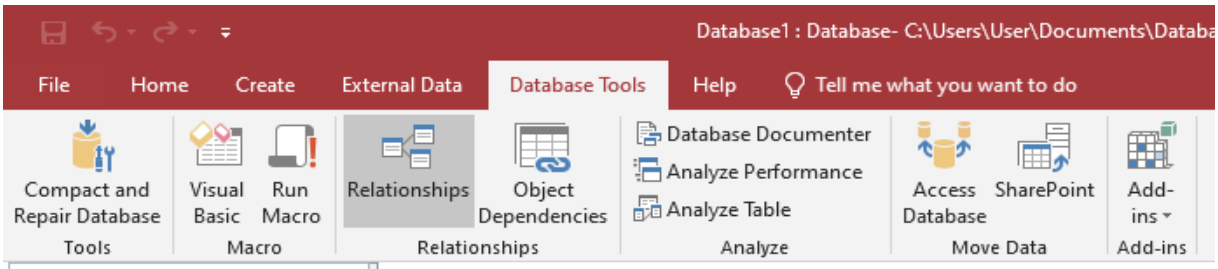
Creating Relationships

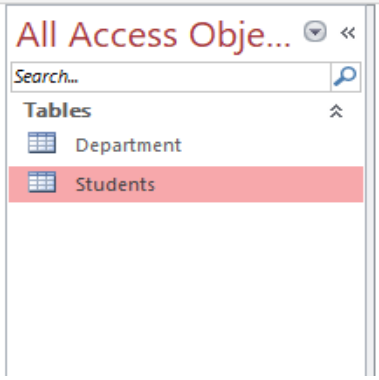
A relationship is usually defined by the foreign key. Tables that have foreign keys have a relationship with tables in which those foreign keys are primary keys.

For example, in our example 1 above we can see that there is a relationship between the department table and students table, since the primary key of the student table is one of the fields in the department table (foreign key).

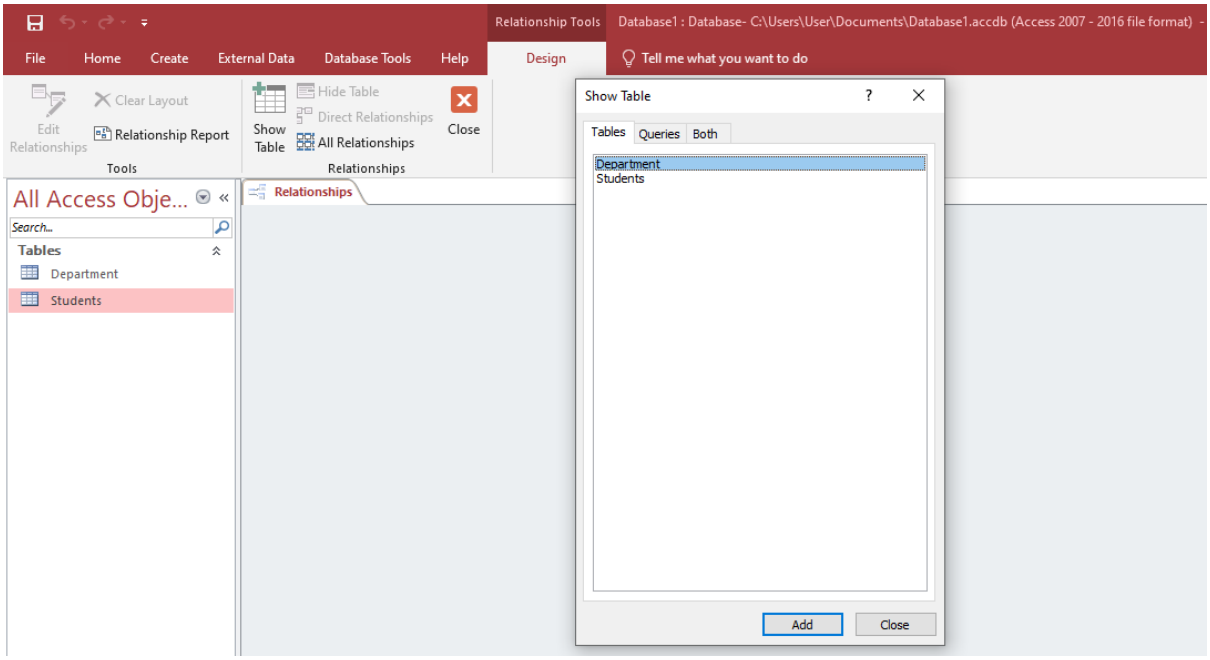
You realize that as human beings its very easy for us to detect these relationships. However, we need to tell Access that there is a relationship between the tables. So how do we do it?

1. Close all the tables whose relationship you want to show
2. Click on the database tools tab.
3. Go to the relationships group and click on relationships

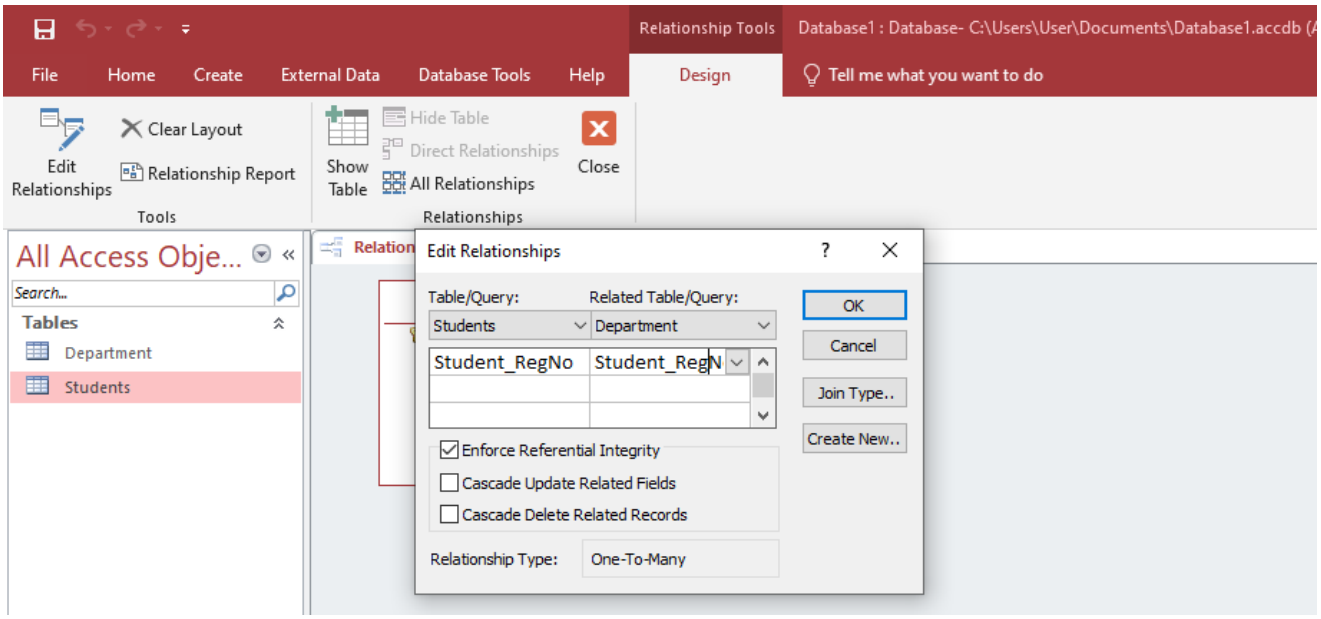




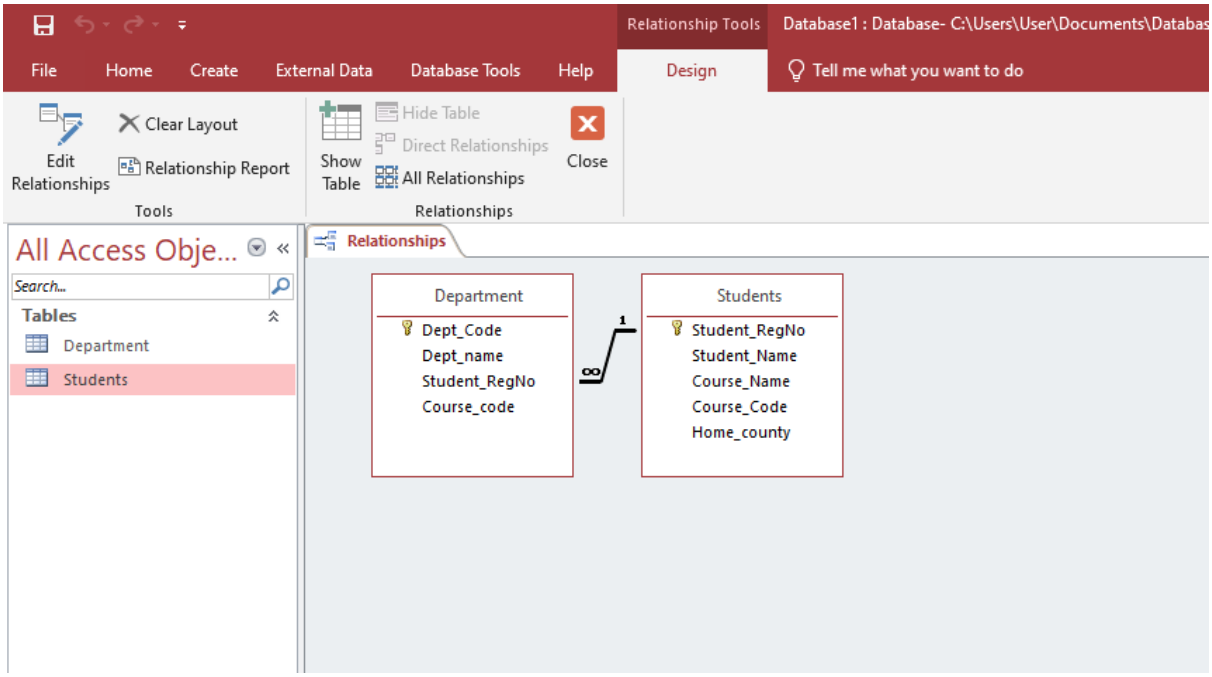
4.
5. The following dialog box will appear, select the tables that you want to show relationship for from the list and click add then click close.



6. The dialog box should close and then display your tables.
7. Now click on the primary key of the student table, drag it and drop it near the Student_RegNo in the department's table.
8. The following dialog box will appear, the dialog box has your two tables so in the student table the primary key will be selected in the departmental table ensure that Student-RegNo isselected.



9. Click on the enforce referential integrity check box and then click ok/create
10. Your relationship is created and demonstrated as follows



Queries

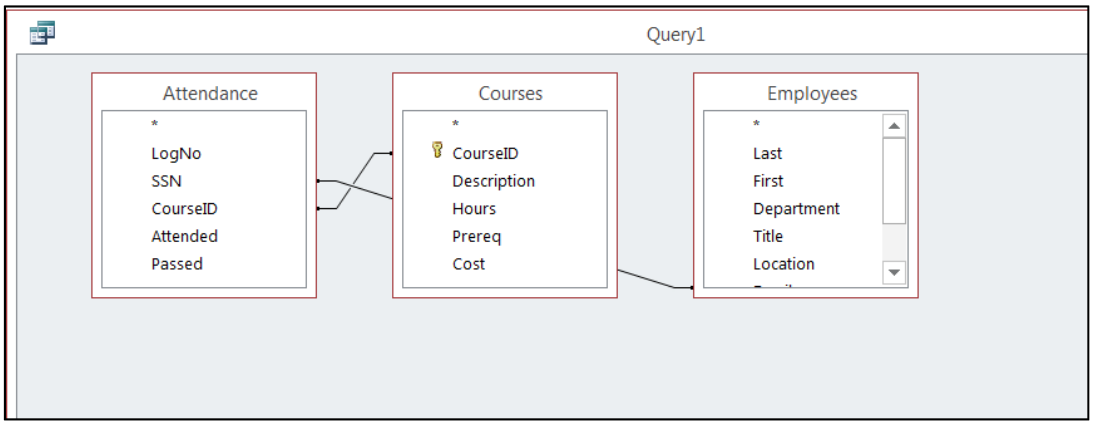
You use queries to view, change, and analyze data in different ways. You can also use them as a source of records for forms and reports.

To Create a Query:

1. Click on the **Create** tab
2. Click on **Query Design** in the **Queries** group
3. Select the table that you would like to base your query on
4. Click **Add**
5. Repeat steps 3 and 4 until all tables are added
6. **Close** the **Show Table** window

The table(s) will now be displayed in the upper part of the **Query Design Screen** by boxes containing the tables' fields.

7. **Double-click** on the field names in the field list window which you would like to include inthe query



Defining Criteria in the Query

In order to control which records are displayed, you must define criteria in a query. The most common type of query is the **Select Records** query which will be discussed below.

To Define Criteria for Your Query:

1. Position your cursor in the criteria row in the field for which you wish to define the criteria for
2. **Type** the criteria

Example: To find all Excel courses:

3. Position your cursor in the criteria row of the **Course ID** field
4. **Type** Excel (Access adds the quote marks to the criteria automatically when you tab to the next column)

Field:	First	First	CourseID	Description	Attended
Table:	Employees	Employees	Courses	Courses	Attendance
Sort:					
Show:	☑	☑	☑	☑	☑
Criteria:			Excel		

5. Click the **Run Query** button

To Save the Query:

1. Click the **Save** icon
2. Enter a name for the query

3. Click **OK**

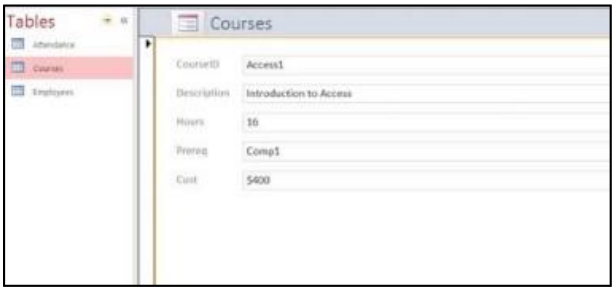
Creating a Form

A form is a database object that is used to enter or display data in a database.

To Create a Form:

1. Open the table or query on which you are basing the form
2. Click on the **Create** tab
3. Click on **Form** in the **Forms** group

A form is created and opens in Layout View.



Different Views:

Form View – this view allows you to view, create and edit records

Layout View - this view is similar to Design View but is more visually-oriented in that each control displays real data. As a result, this is a very useful view for setting the size of controls, or performing many other tasks that affect the visual appearance and usability of the form.

Design View - this view gives you a more detailed view of the structure of the form. You can see the header, detail, and footer sections for the form. You cannot see the underlying data while you are making design changes.

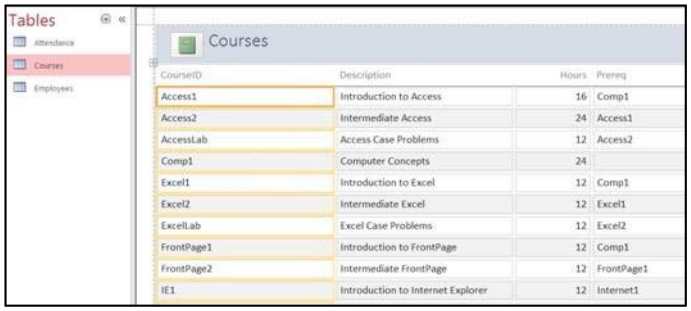
Reports

Reports can be based on tables or queries.

To Create a Report:

1. Open the table or query on which you are basing the report
2. Click on the **Create** tab
3. Click on **Report** in the **Reports** group

A report is created in Layout View.



Different Views:

Print Preview – allows you see what the report would look like on a printed piece of paper

Report View – allows you to see the data without having to display it in Print Preview

Layout View – allows you make design changes while browsing your data

Design View - gives you a more detailed view of the structure of your report

Printing Reports

To Print a Report:

1. Switch to **Print Preview** from **View** on the **Design** tab under **Report Layout Tools**
2. Click the **Print** icon
3. Click on **OK**