FATIMA JINNAH WOMEN UNIVERSITY

Department Of Software Engineering

LAB 01

Summary

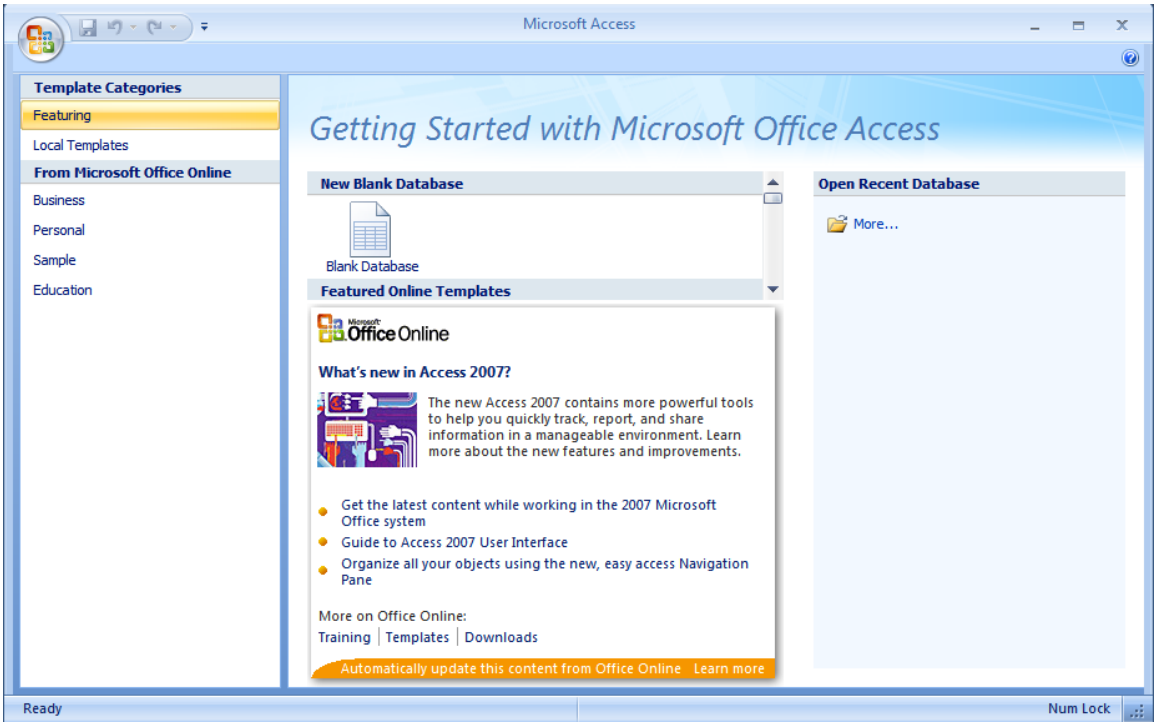
Items	Description
Course Title	Database System
Lab Title	Introduction to Microsoft Access
Duration	3 Hours
Operating System /Tool/Language	Windows Operating System/Microsoft Access 2007
Objective	To get familiar with the Microsoft access, creating blank database, introducing and creating tables in datasheet and design view, working with data on sorting and filtering

Introduction to Microsoft Access

Access 2007 is the database software, which allows storing, managing, searching, large amount of information.

Creating a New Database:

To create a new database, open Microsoft Access which is installed in Microsoft Office.



To build a new database

- Select New Blank Database.
- By selecting New Blank Database, a panel will show up on the right, which allows us to create a blank database by entering the database name and choosing the location where on the computer we want to create the new database.
- Click New Blank Database -> Blank Database.

After creating a blank database and type the database name, you can create the following six objects.

Tables	A collection of data about a specific topic, such as products or suppliers. In Access, data is stored in tables. A table is a set of columns and rows, with each column referred to as a field. Each value in a field represents a single type of data. Each row of a table is referred to as a record.
Queries	A command for viewing or analyzing data in different ways or a result of the command. You use queries to retrieve specific data from your database and to answer questions about your data. For example, you can use a query to find the names of the employees in your database who live in a particular state.
Forms	A friendly interface to add a new record. Forms give you the ability to choose the format and arrangement of fields. You can use a form to enter, edit, and display data.
Reports	An object that present data in a organized way according to your specification.

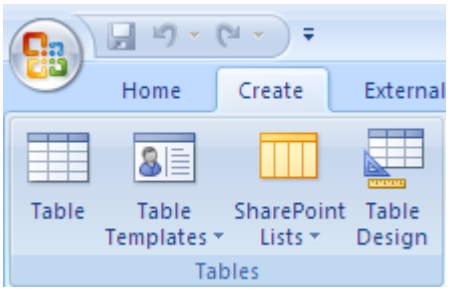
	Examples are telephone bills, sales summary etc. Reports organize or summarize your data so you can print it or view it onscreen. Often use reports when you want to analyze your data or present your data to others.
Macros	A set of one or more actions that each performs a particular operation, such as opening a form or printing a report. Macros can help you to automate common tasks. For example, you can run a macro that prints a report when a user clicks a command button. Macros give you the ability to automate tasks. One can use a macro to add functionality to a form, report, or control.
Modules	A collection of Visual Basic for Applications declarations and procedures that is stored together as a unit. Modules give you the ability to automate tasks and add functionality to a form, report, or control. Macros are created

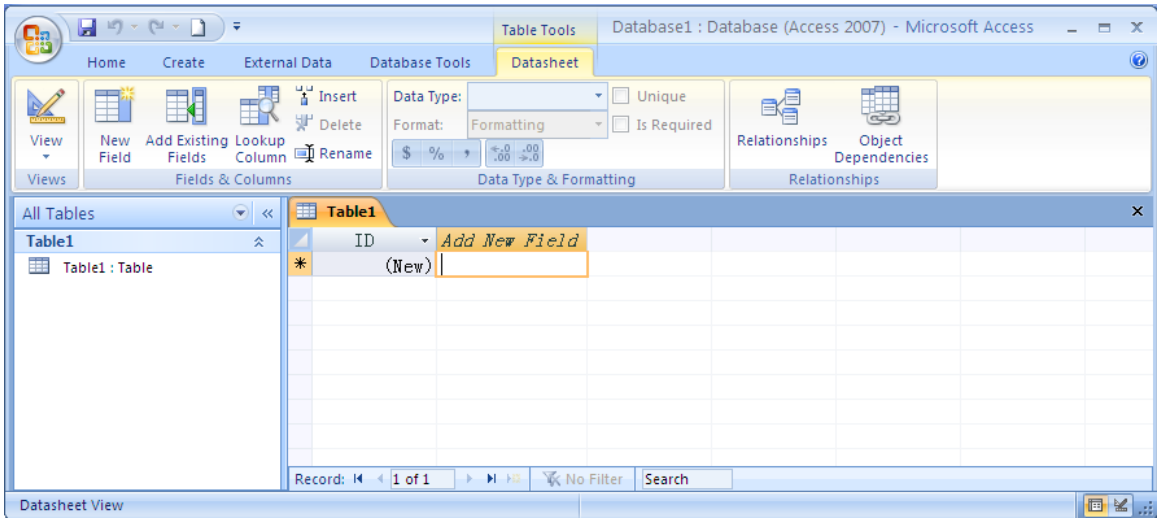
Creating Table:

A table is a set of columns and rows. Each column is called a field. Within a table, each field must be given a name and no two fields can have the same name. Each value in a field represents a single category of data. Each row in a table is called a record.
There are different ways to create table

Create a Table in Datasheet View

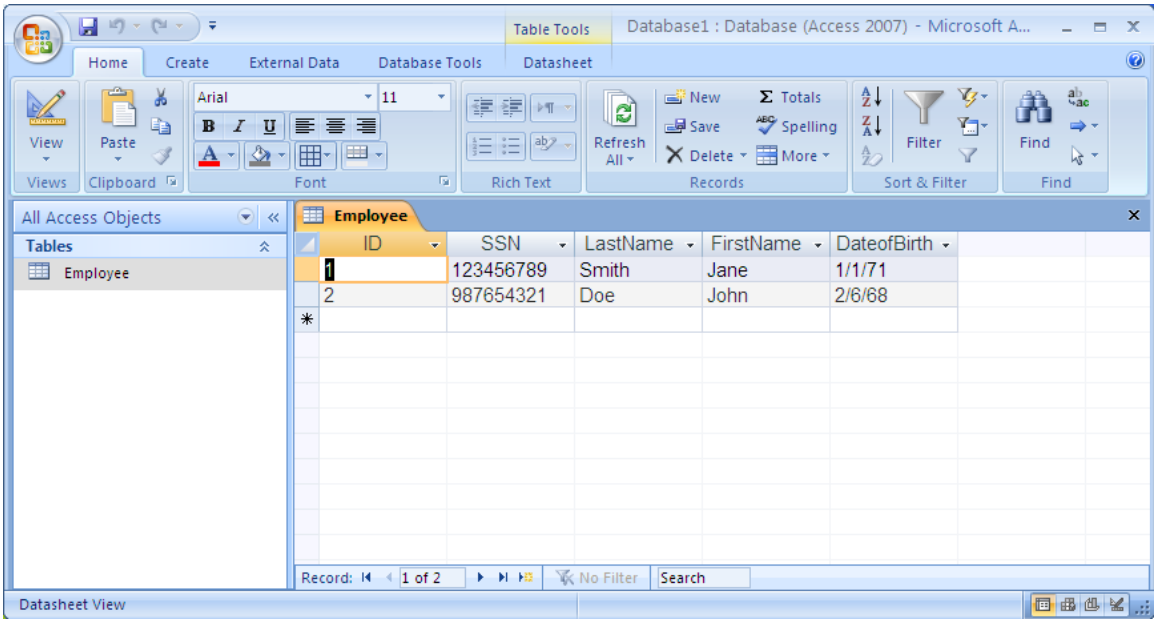
- To create a blank (empty) table in datasheet view, on the Ribbon you can: Click Create→Table.
- Now a Datasheet View with column headings ID and Add New Field across the top of the datasheet as shown in Figure below. You can enter data directly into it. After entering data and hit the Enter key, the column heading - Add New Field automatically changes to Field1 and the next column's heading becomes Add New Field. At the same time, an ID number will be assigned to that row.
- When you save the new datasheet, Microsoft Access will analyze your data and automatically assign the appropriate data type and format for each field. Because the names of each field are not descriptive, you may want to rename the fields.



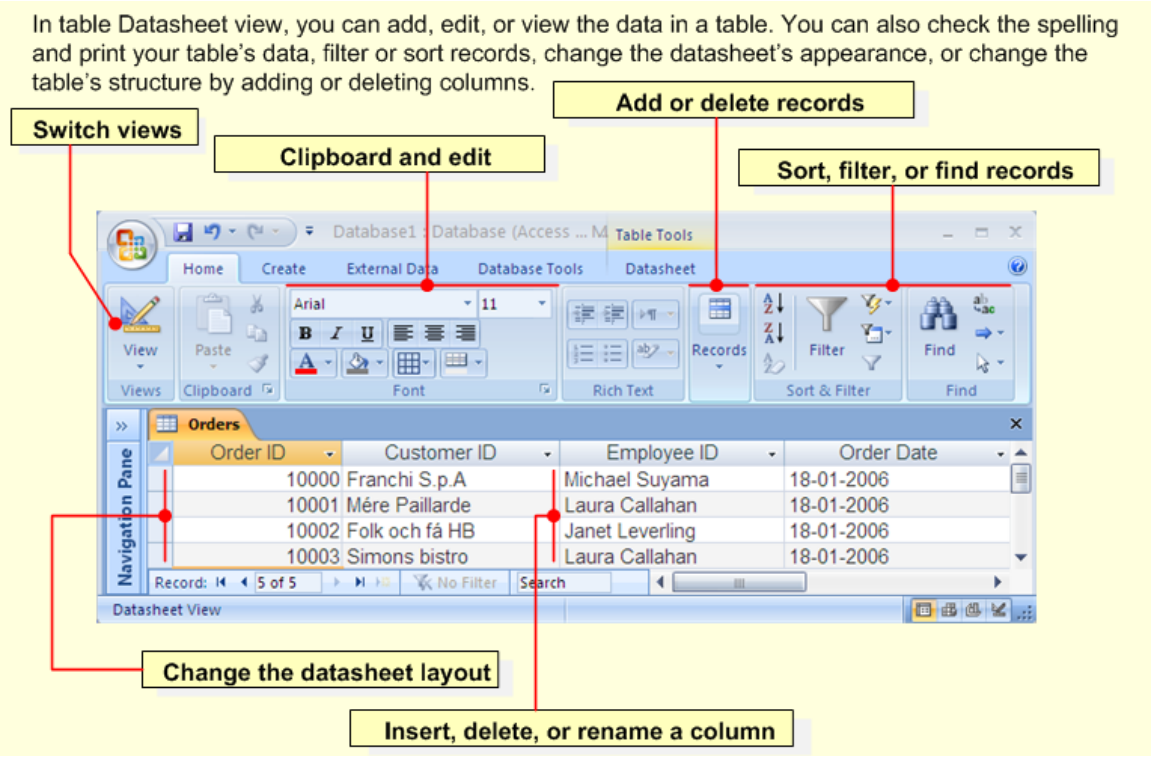


- To rename the field, place the cursor over the column heading you want to rename and double click. The column heading will appear highlighted and the cursor will be blinking
- Type the name you want to use and then press the Enter key.
- Repeat the first two steps for the second column, and so on.

As the column corresponds to the field, the row corresponds to the record. To add the information. Say that, if we are doing a database of a company, the first table we may have is ***Employee***. And the fields of Employee may contain SSN, LastName, FirstName, and so on.

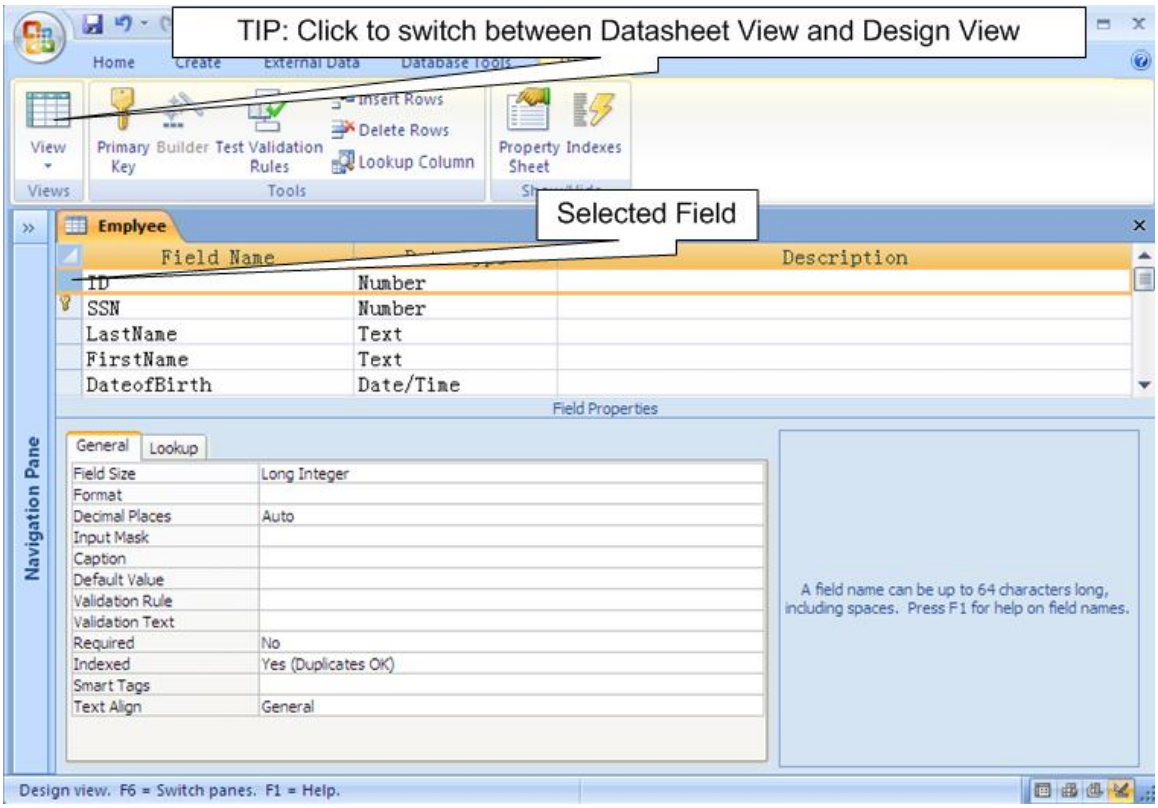


The overall summary of datasheet view is given in figure below:



Create a Table in Design View

- In Design View you can add fields, define how each field appears or handles data, and create a primary key. To create a blank (empty) table in design view. Click Create→Table Design.
- In this view, we can specify detailed properties for each field. This includes the length and type of information used in the field. But to enter data into the table, must use Datasheet View or Forms. The design view for the example Employee table mentioned before will look like:



There are three columns on the top portion of the window.

- The Field Name is the name of the fields. For example, SSN, FirstName, LastName are proper field names for the Employee table. The name for a field must follow MS Access object-naming rules (Object-naming rules are a set of specific rules for naming Microsoft Access objects. In Microsoft Access, names can be up to 64 characters long and can include any combination of letters, numbers, spaces, and special characters except a period (.), an exclamation point (!), an accent grave (`), and brackets ([ ]). Note that you also can't use leading spaces or control characters (ASCII values 0 to 31)).
- The Data Type is like the domain of an attribute. It provides a list of data types that we can choose from, including Text, Memo, Number, Date, and so on.
- The Description column allows us to describe the field and it is optional. It is always good practice to be descriptive in your comments. This allows new users to easily understand the specifications and meaning of your fields.

You can set up properties of fields in the Field Properties window at the bottom half pane.

- Before saving the table and quit, there is need to specify the primary key. In Employee table, SSN will be good for primary key. To define SSN as the primary key, click the Field Selector for the SSN field.
- Field Selector is the gray bar on the left side of the Table Design grid by each field. When click here, the whole row appears highlighted.

- Then click menu Edit→Primary Key or click the Primary Key button on the toolbar in design view, a key symbol will appear on the Field Selector. Save the table as Employee.

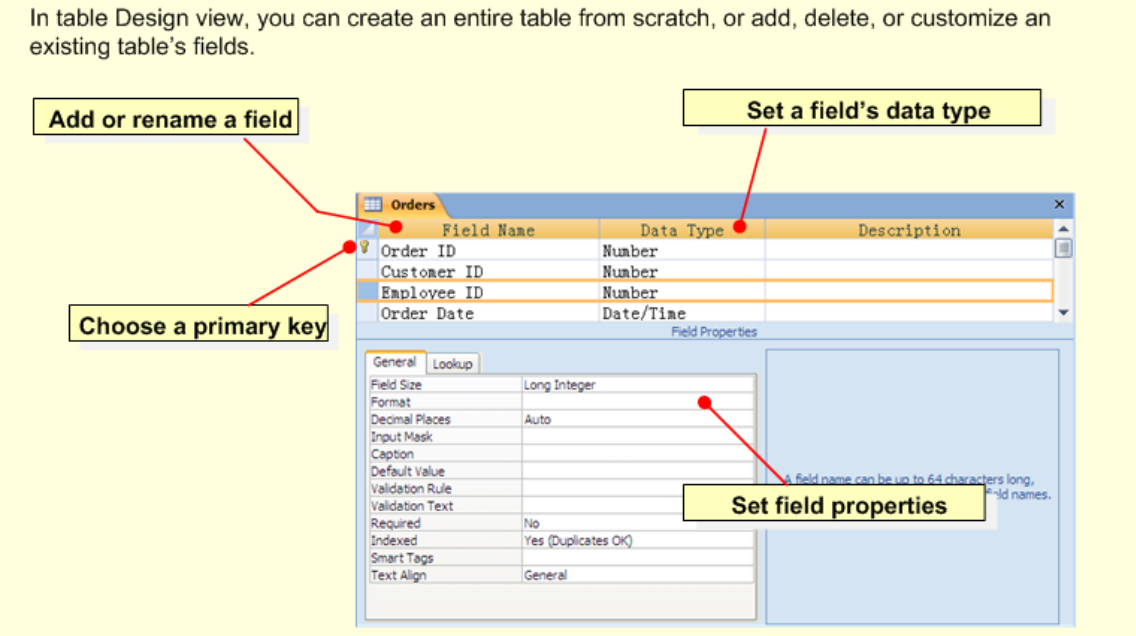
Field Property	Description
Field Size	The maximum number of characters you can enter in the field. The largest maximum you can set is 255.
Format	The display layout for the field. Select a pre-defined format or enter a custom format.
Input Mask	A pattern for all data to be entered in the field.
Caption	The label for the field when used on a form. If you don't enter a caption, the field name is used as the label.
Default Value	A value that is automatically entered in the field for new records.
Validation Rule	An expression that limits the values that can be entered in the field.
Validation Text	The error message that appears when you enter a value prohibited by the validation rule.
Required	Specify whether the field is required data entry.
Allow Zero Length	Specify whether allow zero-length strings in the field.
Indexed	An index speeds up searches and sorting on the field, but may slow updates. Selecting "Yes - No Duplicates" prohibits duplicate values in the field.

Table: Field Properties in Design View

Setting	Type of data	Size
Text	(Default) Text or combinations of text and numbers, as well as numbers that don't require calculations, such as phone numbers.	Up to 255 characters or the length set by the FieldSize property, whichever is less. Access does not reserve space for unused portions of a text field
Memo	Lengthy text or combinations of text and numbers.	Up to 65,535 characters.
Number	Numeric data used in mathematical calculations.	1, 2, 4, or 8 bytes (16 bytes if the FieldSize property is set to Replication ID).
Date/Time	Date and time values for the years 100 through 9999.	8 bytes.
Currency	Currency values and numeric data used in mathematical calculations involving data with one to four decimal places. Accurate to 15 digits on the left side of the decimal separator and to 4 digits on the right side.	8 bytes.
AutoNumber	A unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table. AutoNumber fields can't be updated.	4 bytes (16 bytes if the FieldSize Property is set to Replication ID).
Yes/No	Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off).	1 bit.
OLE Object	An object (such as a Microsoft Excel spreadsheet, a Microsoft Word document graphics, sounds, or other binary data) linked to or embedded in.	Up to 1 gigabytes (limited by available disk space).
Hyper Link	Text or combinations of text and numbers stored as text and used as a hyperlink address. The easiest way to insert a hyperlink address in a field or control is to click Hyperlink on the insert menu in the datasheet view.	Each part of the three parts of a Hyperlink data type can contain up to 2048 characters.
Attachment	Many types of files can be stored in a column which has the attachment data type. Someone can add bitmap files, jpg files, sound files, word documents, etc. to a column without increasing the size of the database.	Up to 256 megabytes.
Lookup Wizard	Creates a field that allows you to choose a value from another table or from a list of values by using a list box or combo box. Clicking this option starts the Lookup Wizard, which creates a Lookup field. After	The same size as the primary key field used to perform the lookup, typically 4 bytes.

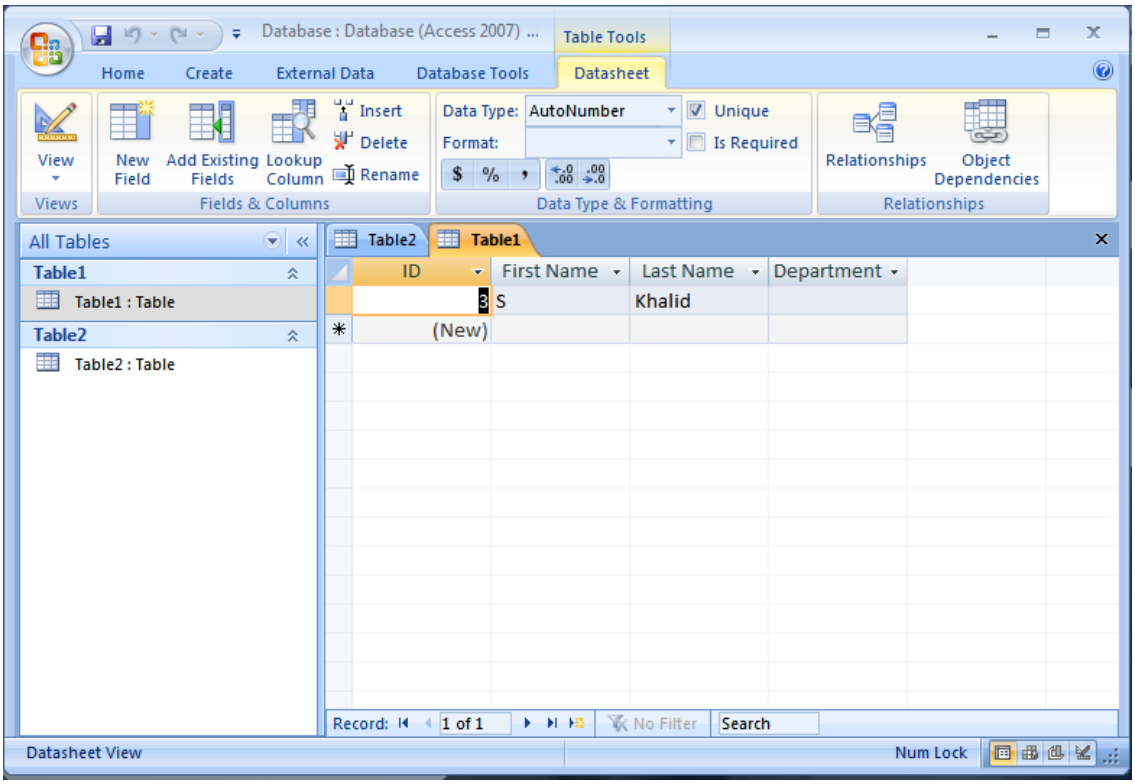
Table: Data Types in MS Access

Summarizing Design View

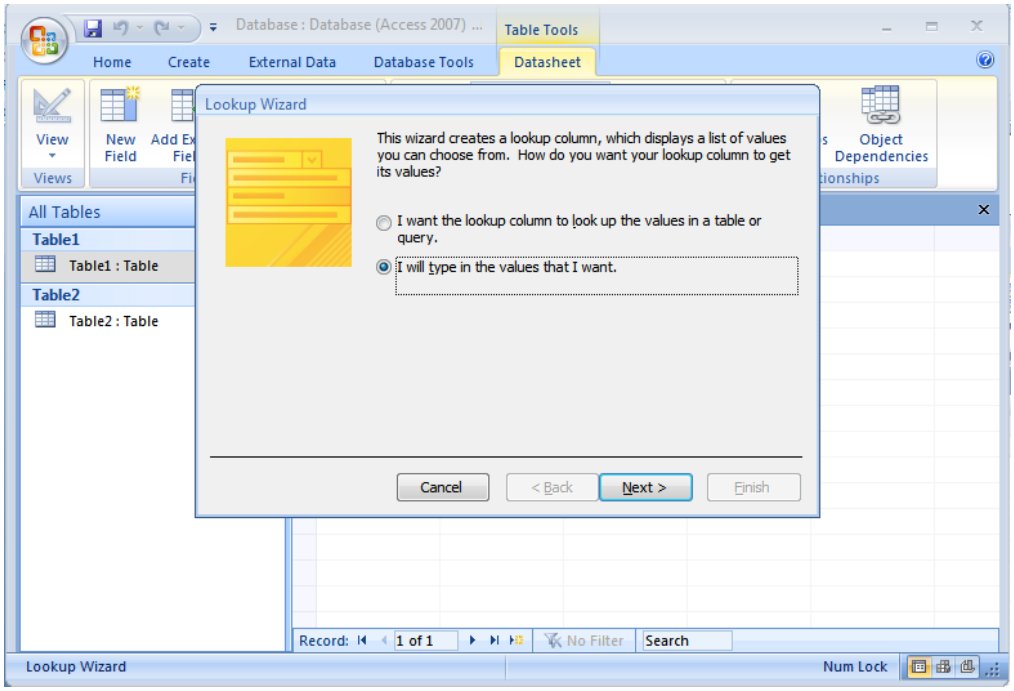


Lookup Column

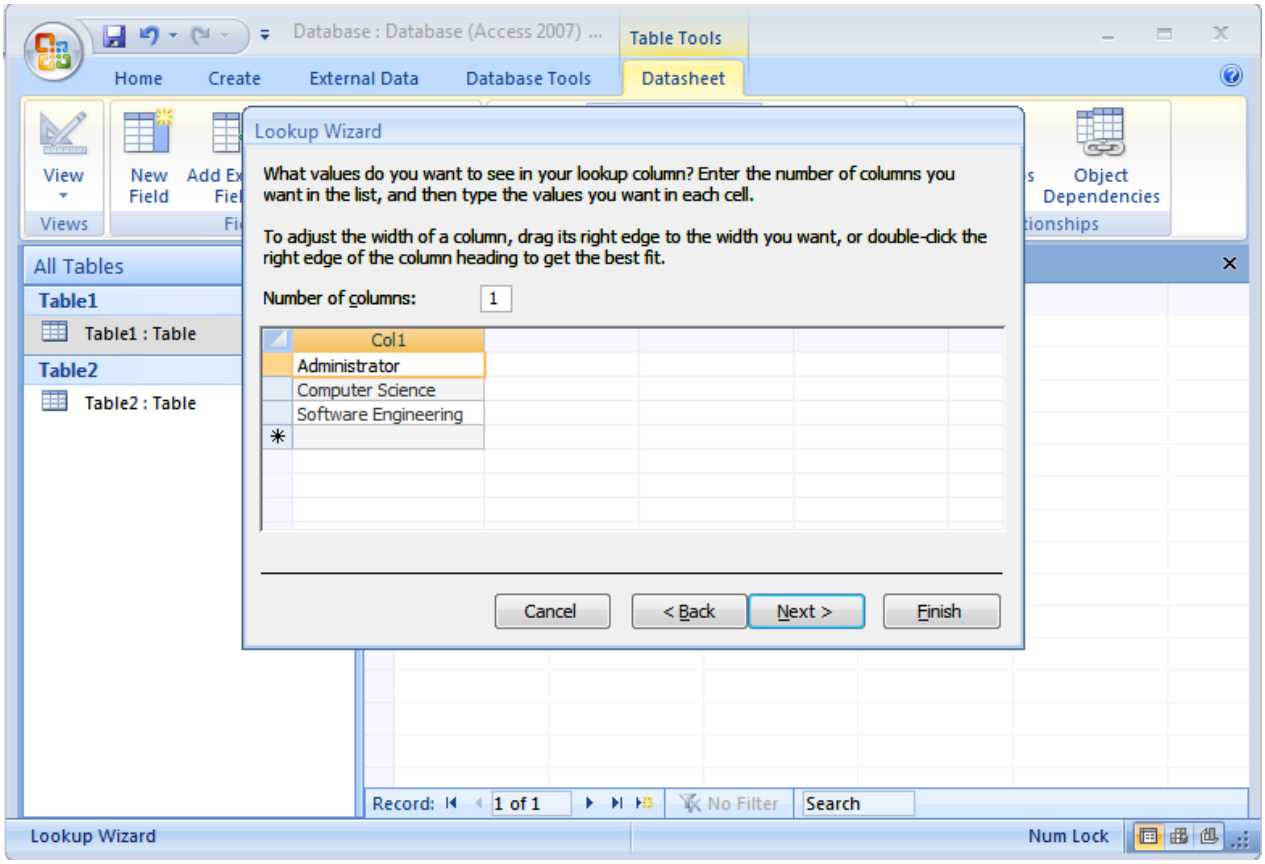
If a field can contain a finite list of values, you can create a Lookup Column and users can select the value they want from a list. For example, if the employees at a school can only work in one of the following departments: Administration, Computer Science, English, History, or Math. Create a table Departments table that lists the departments and then use the list in the Employee table to assign each employee to a department.

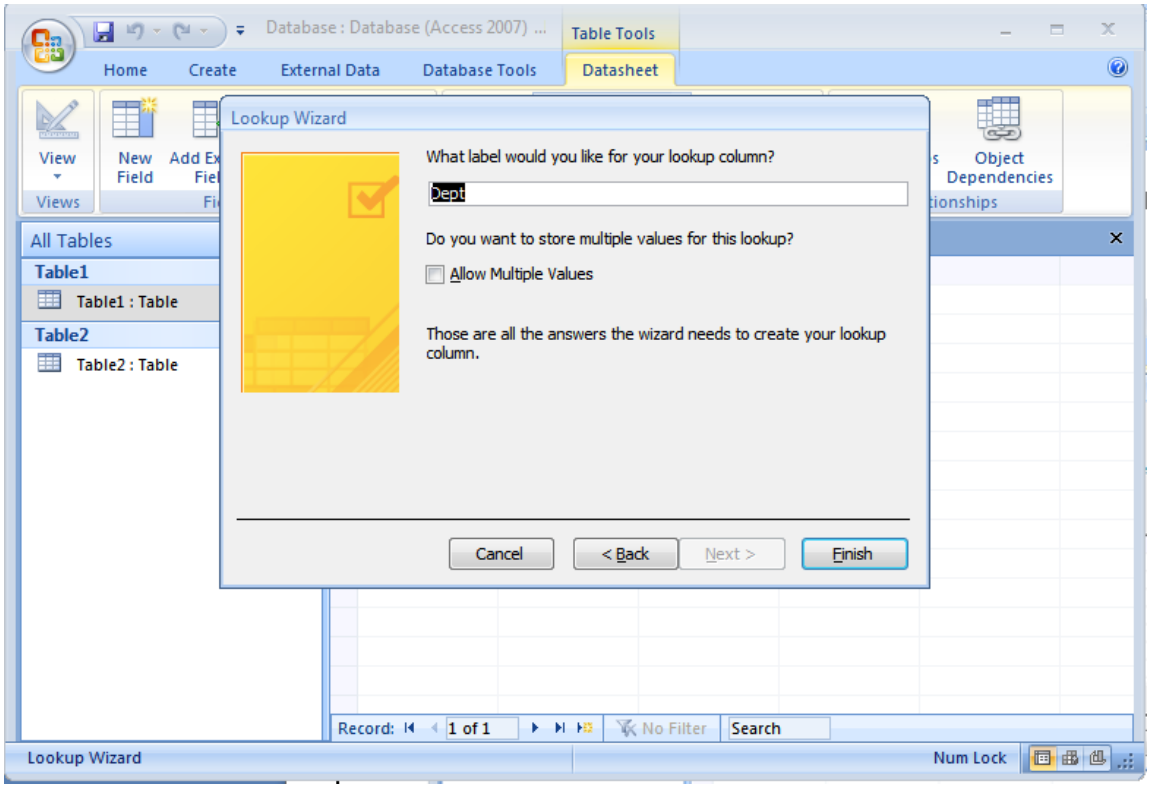


- Click on the Datasheet Tab and then select "Lookup Column", the lookup wizard will open.

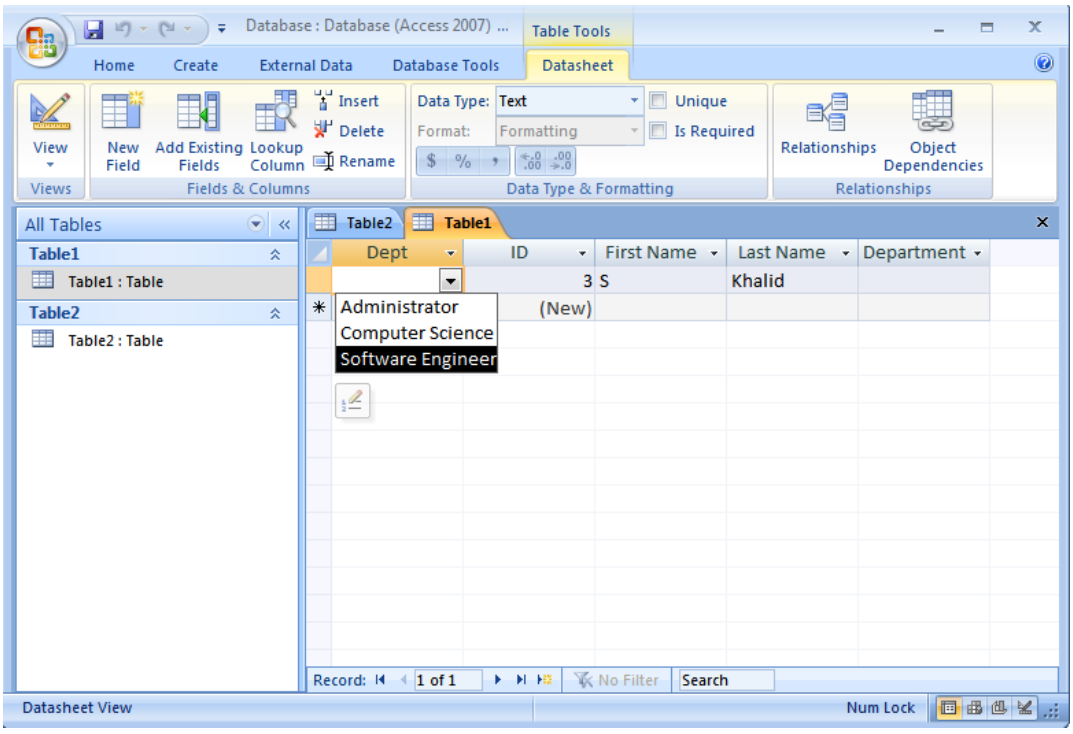


- Now enter the possible values for the filed





- Then click on Finish button, and now the lookup column is added.



Now experiment look up table by using the second option

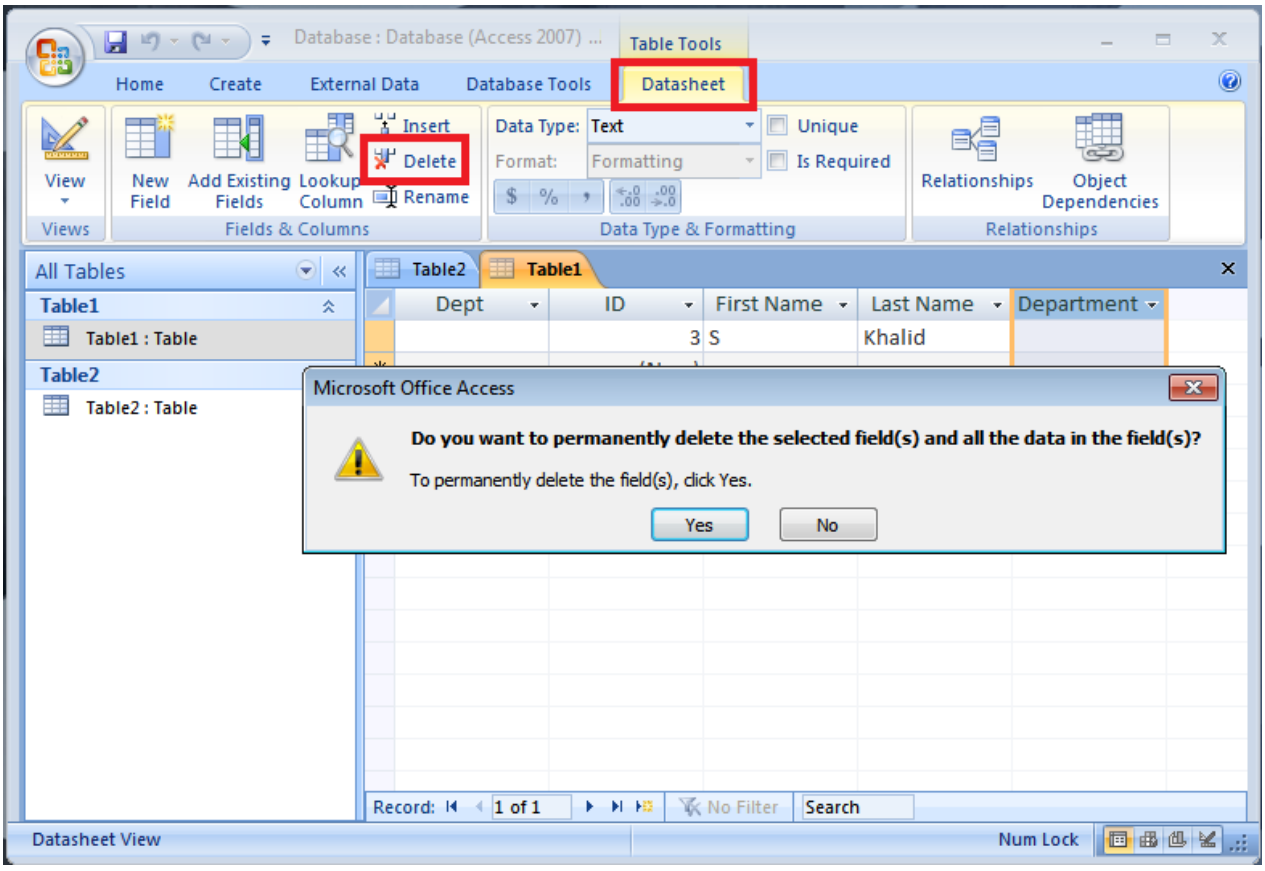
Modify a Table

After you create a table, you may need to modify it. You can delete columns, insert columns, or move columns.

Delete Columns

The Delete option permanently deletes columns and all the data contained in them. It is not possible to undo a column delete.

- Click and drag to select the columns you want to delete.
- Activate the Datasheet tab.
- Click Delete in the Fields & Columns group. A prompt appears.
- Click Yes. Access deletes the columns you selected.



Insert & Rename Columns

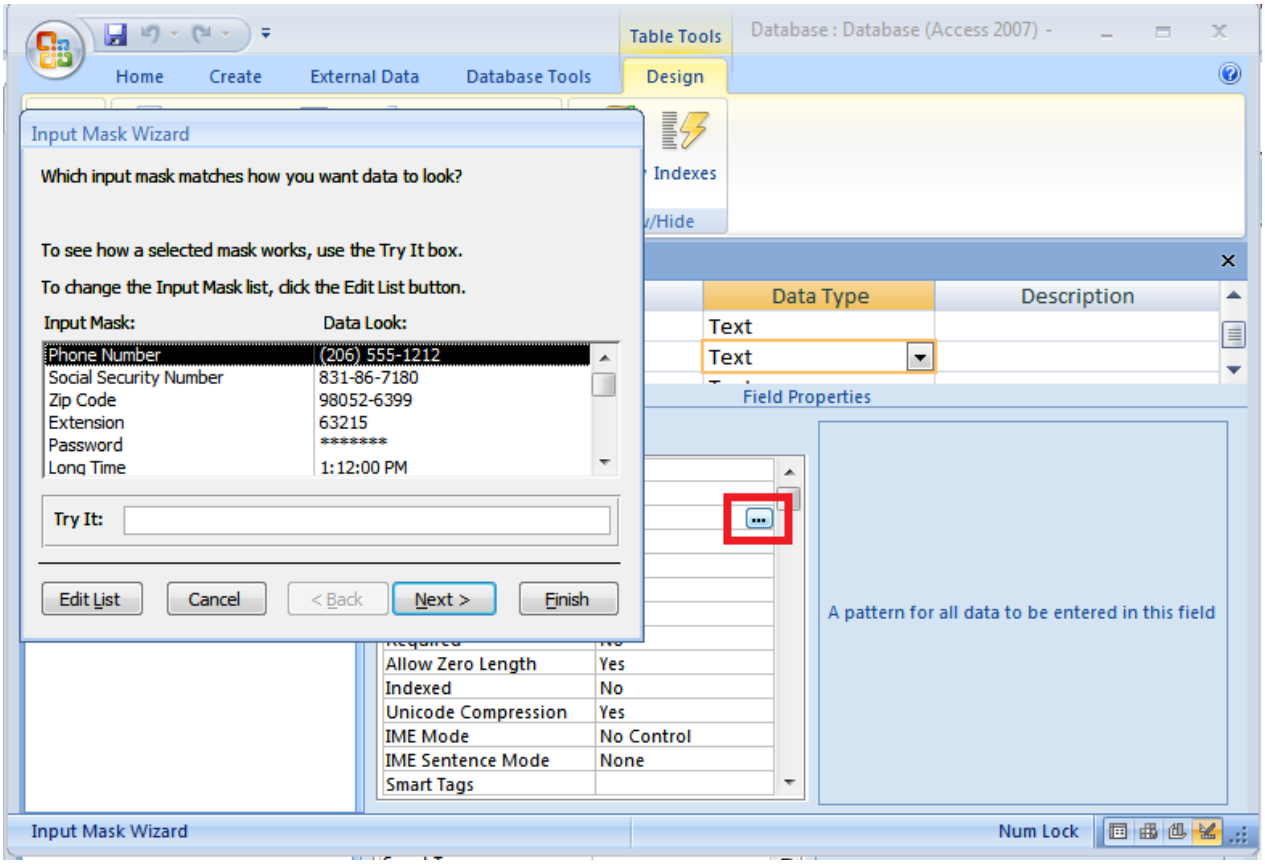
The Insert option inserts a column before the selected column and one can also rename the selected column

Input Masks

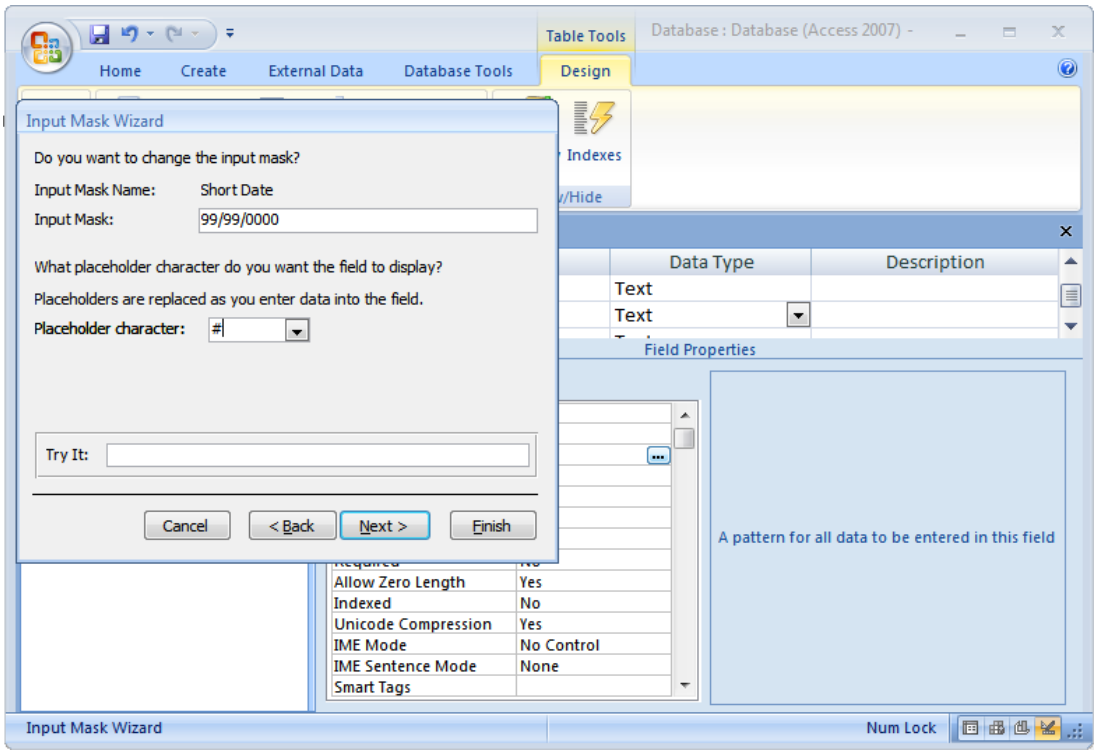
An Input Mask is used to pre-format a field to "look/act" a certain way when a user inputs data. Example: You could create an input mask for a Social Security Number field that automatically inserts the dash.

To Create an Input Mask for a Field

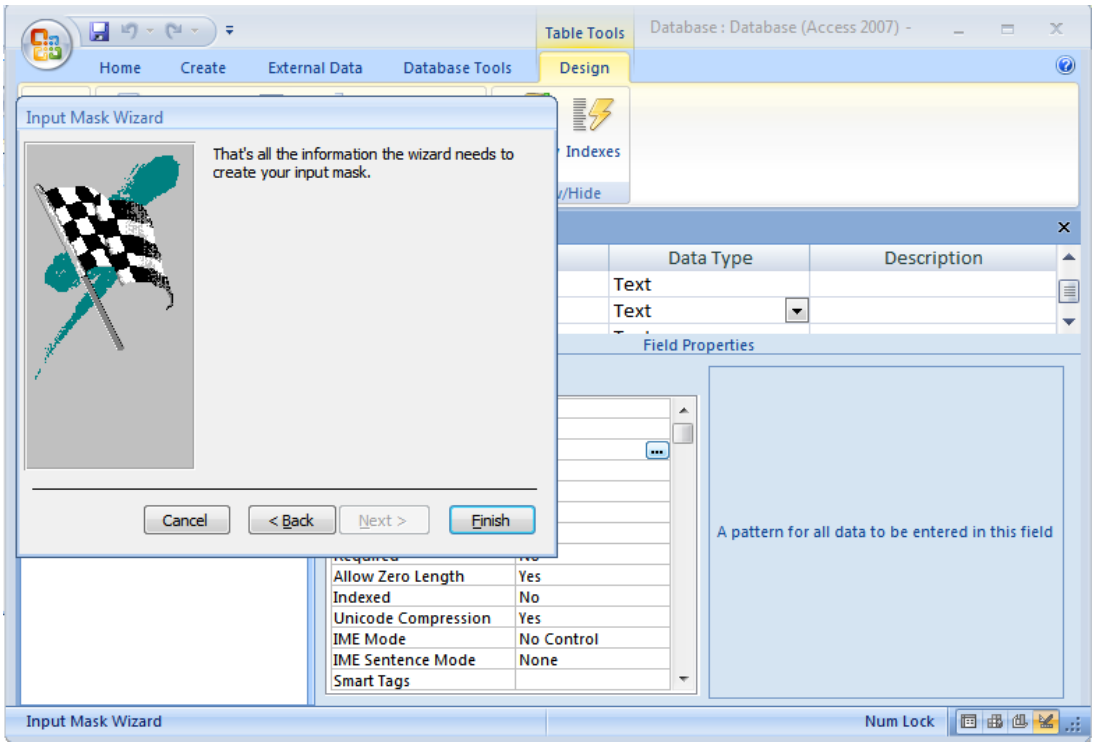
- Open a table in Design View
- Click in a field for which you'd like to create an input mask
- In the Field Properties section at the bottom of the screen, click in the Input Mask line and notice the Build button that appears at the right end of the line



- **C**lick the Build button
- Select Input Mask
- Click Next
- Select a Placeholder character
- Click Next



- Click Next
- Click Finish



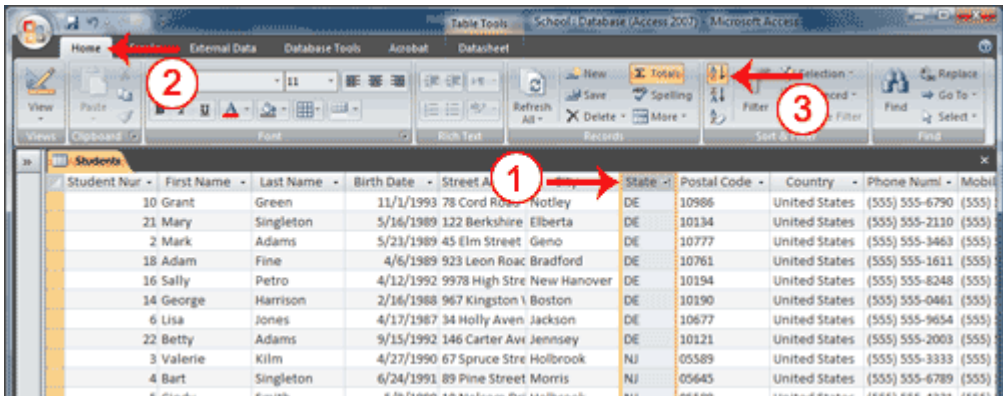
Now, when entering data that has been formatted with an Input Mask, you do not have to type the format into the record.

Sorting & Filtering

One can sort Access data so you can view records in the order you want to view them, and by filter data so you only see the records you want to see.

Sort a Table

By sorting, you can put a column of information in alphabetical, numerical, or date order. One can sort in ascending order (alphabetical from A to Z, lowest number to highest number, earliest date to latest date) or descending order (alphabetical from Z to A, highest number to lowest number, latest date to earliest date). One can also sort within a sort. For example, can sort by state and then sort within each state by city. When sorting within a sort, perform the innermost sort first. For example, if you are sorting by state and then city, sort the city first and then sort by state.



- Click the column label for the column you want to sort.
- Activate the Home tab.
- Click the Ascending  or Descending button  in the Sort & Filter group. Access sorts the column in ascending or descending order.

To remove a sort:

- Activate the Home tab.
- Click the Clear All Sorts button  in the Sort & Filter group. Access clears all of the sorts you have applied.

Filter a Table

One can apply a filter to see only the records you want to see. For example, perhaps database contains students from the states of DE, NJ, and PA and only wants to see the students from DE. Filter data so only DE students display. Each time apply a filter to a column, it replaces any previous filter you applied to that column. For example, if you apply a filter so you only see students in DE, and later you apply a filter so only see students in NJ, Access clears the DE filter and then applies the NJ filter.

One can apply filters to multiple columns in the same table. For example, by applying a filter first to the State field and then to the Last Name field, you can see all of the students in the state of DE whose last names are Adams.

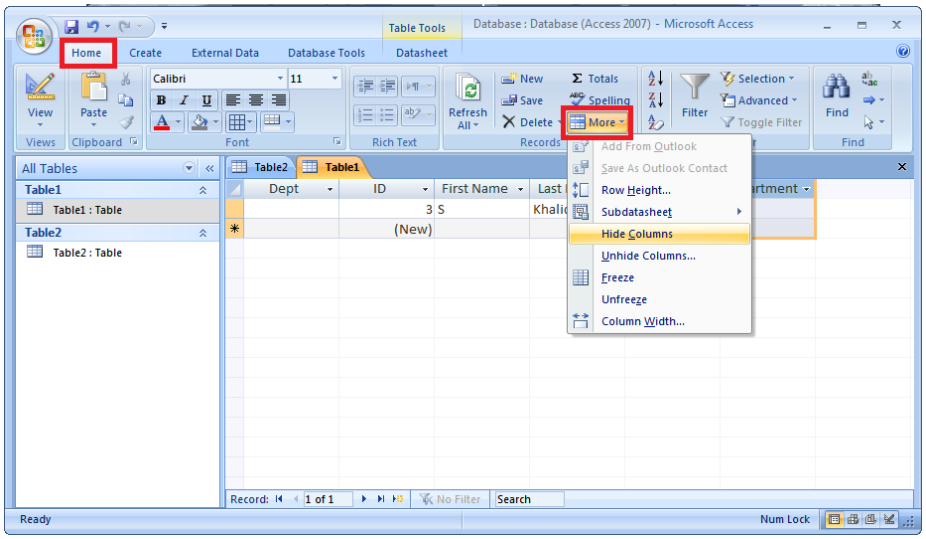
- Click the column label for the column you want to filter.
- Activate the Home tab.
- Click the Filter button. A menu appears.
- Uncheck the items you do not want to appear, making sure only the items you want are checked.
- Click OK. Access filters your data and displays the word Filtered at the bottom of the window.

To remove a filter:

- Activate the Home tab.
- Click Advanced in the Sort & Filter group. A menu appears.
- Click Clear All Filters. Access clears all the filters you have applied.

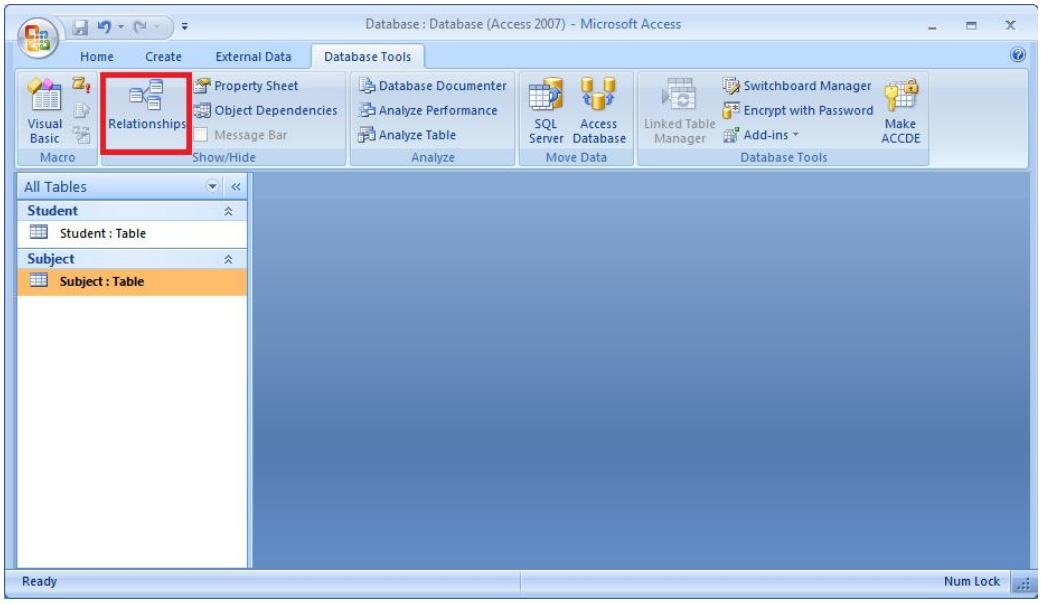
Hide Columns

There may be times when one may not want to display a certain column or set of columns. In such cases, temporarily hide the column or columns from view. Later, if want to display them column again, unhide them.

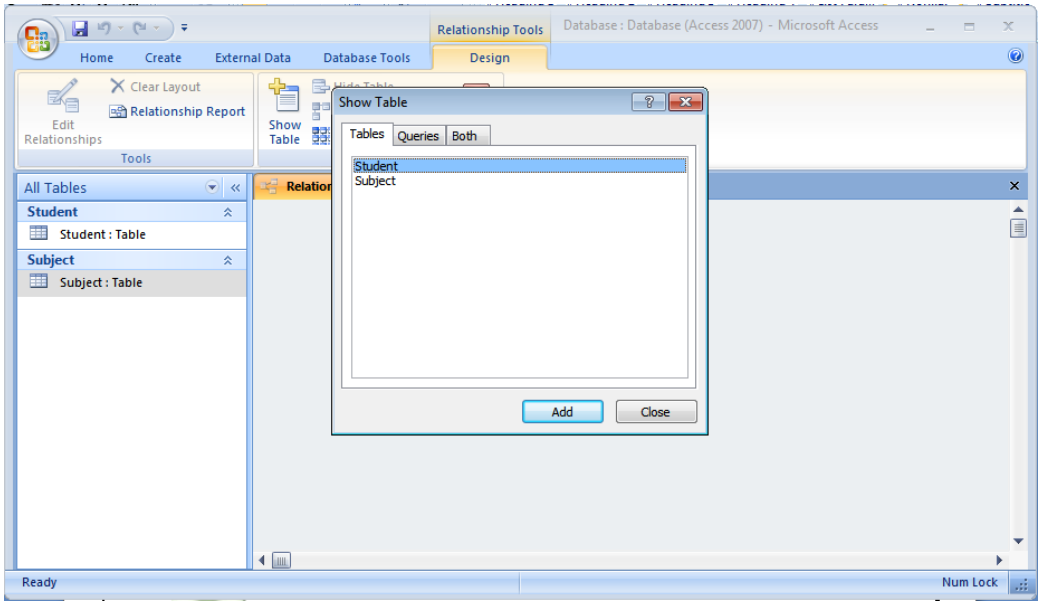


Creating Relationship

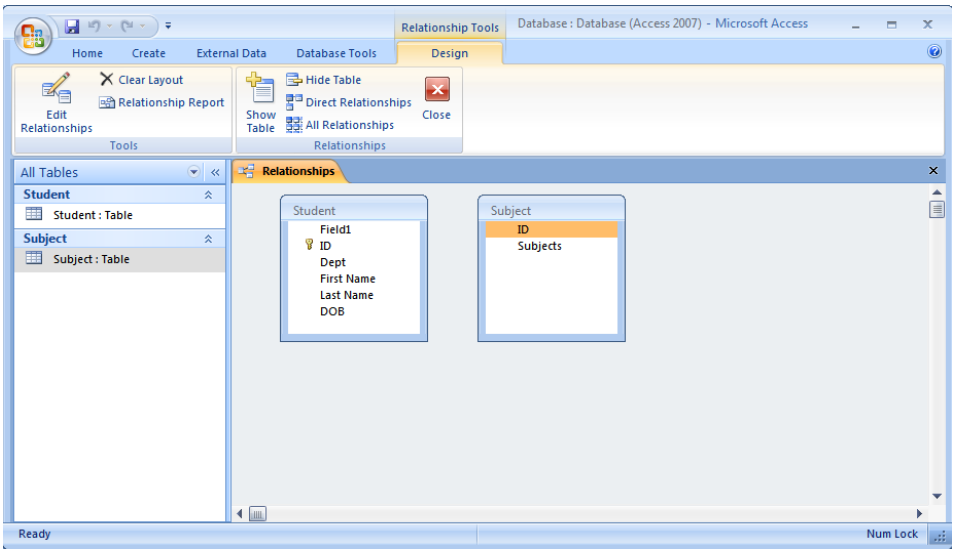
- Close all tables and forms. (Right-click on the tab of any Object. A menu appears. Click Close All.)
- Activate the Database Tools tab



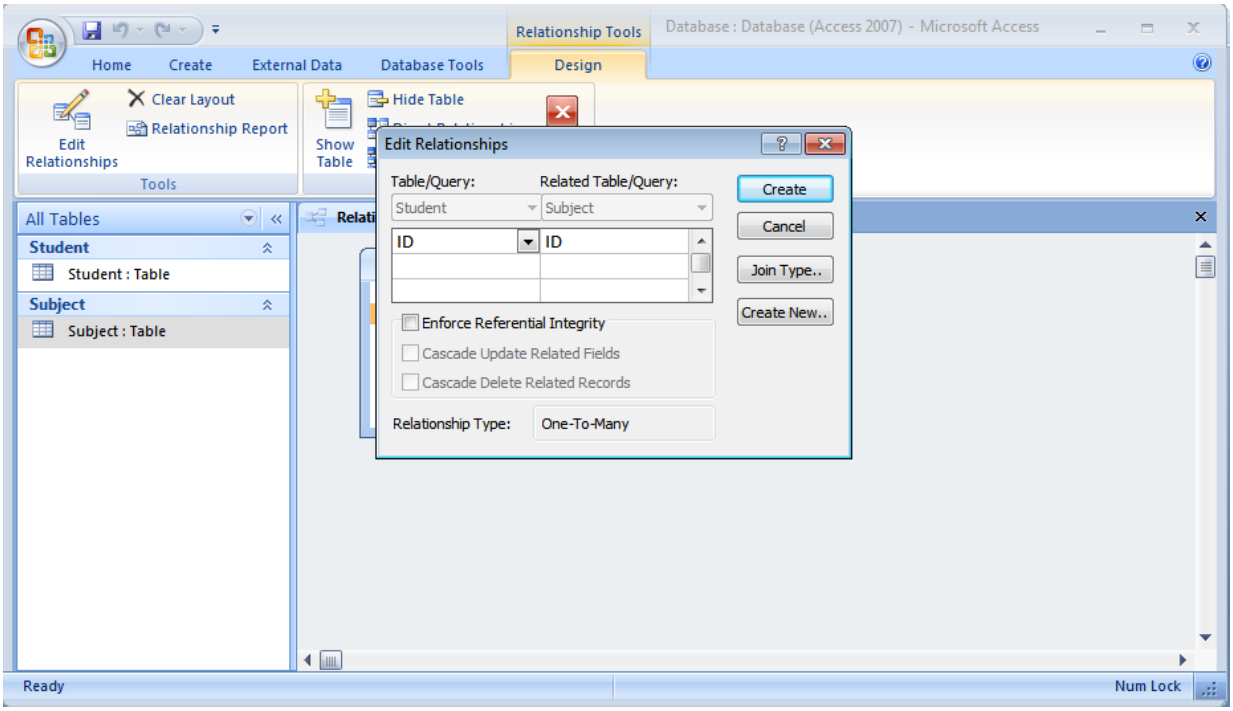
- Click on the Relationship



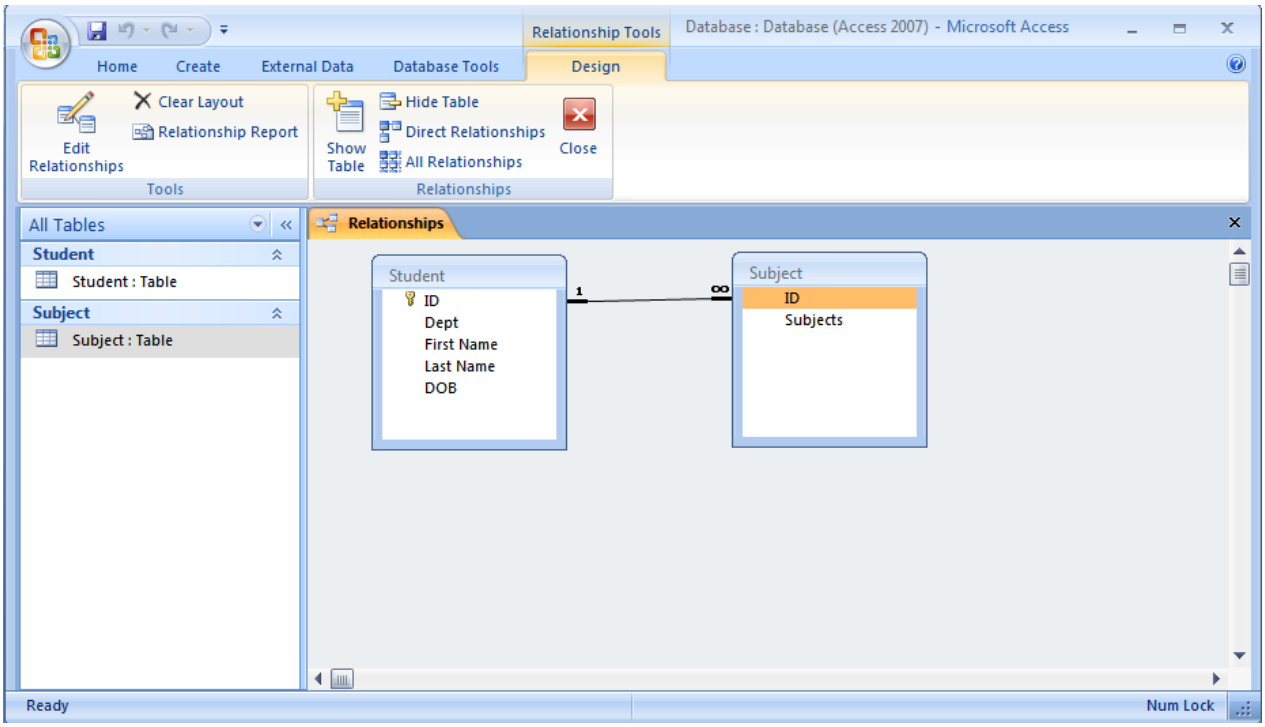
- Now add both tables
- Click the Close button to close the Show Table dialog box.



- Drag the Primary table's primary key over the related table's foreign key. After you drag the primary key to the related table's box, the cursor changes to an arrow. Make sure the arrow points to the foreign key. The Edit Relationships Dialog box appears.



- Click the Enforce Referential Integrity checkbox.
- Click Create. Access creates a one-to-many relationship between the tables.
- Click the Save button on the Quick Access toolbar to save the relationship.



There are different options available when creating relationships:

- Referential integrity is a system of rules that Microsoft Access uses to ensure that relationships between records in related tables are valid and that you do not accidentally delete or change related data. The following rules apply when you use referential integrity:

- If you click the Cascade Update Related Fields check box when you are defining a relationship, any time you change the primary key of a record in the primary table, Microsoft Access automatically updates the primary key to the new value in all related records. For example, if change a customer's ID in the Customers table, the CustomerID field in the Orders table is automatically updated for every one of that customer's orders so that the relationship is not broken. Microsoft Access cascades updates without displaying any message.

- If you select the Cascade Delete Related Records check box when you are defining a relationship, any time that one delete records in the primary table, Microsoft Access automatically deletes related records in the related table. For example, if you delete a customer record from the Customers table, all the customer's orders are automatically deleted from the Orders table (this includes records in the Order Details table related to the Orders records). When delete records from a form or datasheet with the Cascade Delete Related Records check box selected, Microsoft Access warns you that related records may also be deleted. However, when you delete records using a delete query, Microsoft Access automatically deletes the records in related tables without displaying a warning.

LAB TASKS

1. Create a table named "SALESPERSON" consisting of following fields.

Field	Data Type	Width	Other Information
Salesperson ID	Auto number		Primary Key
Last Name	Text	12 char	
First Name	Text	10 char	
SSN	Text	11 char	Input mask as SSN
Common Rate	Number	Single, 3 decimal places	Commission rate is entered as a percentage, thus 6.5% is entered as .065
Office	Text	4 char	Possible values are SAV or BRU or ATL or GRE or CHA)
State	Text	2 char	Upper case (> in format); Default Value is GA
Company Car	Yes/No		

2. Create a table named "CUSTOMER" made up of following fields:

Field	Data Type	Width	Other Information
Customer ID	Auto number		Primary Key
Customer Name	Text	15 char	
Customer City	Text	12 char	
Employee Number	Long Integer	5 digits	Foreign Key: Same as in the Salesperson table

3. Create the relationship between the tables created above and also make sure "Enforcement of referential Integrity".
4. Insert the data in the above two tables
5. Best Fit all column widths and take a screenshot of print preview
6. Sort the data according to the Employee Name and Customer Name.
7. Now Filter the CUSTOMER table according to Employee Number 3

Note: Take a screen shot of every single step

References:

[1]: Introduction to MS Access, https://docs.fajardo.inter.edu/Acad/atorres/MSAccess/Forms /DispForm.aspx? ID=3

[2]: How to edit records in a access database, http://support.microsoft.com/kb/304473

[3]: Figures: https://docs.fajardo.inter.edu/Acad/atorres/MSAccess/Forms/DispForm.aspx?ID=3