Unit 10: Microsoft Access Queries

Introduction

Queries are a fundamental means of accessing and displaying data from tables. Queries used to view, update, and analyze data in different ways. Queries can access a single table or multiple tables. For example, you want to view a list of employee id and name, but you do not want to see phone number and other data, you can create a query that displays the employee's id and name only. Alternatively, if you want to know which employee lives in Dhaka, you can restrict your list to those employees. We will know how to create query in this lesson.

Lesson 10.1: Different Types of Queries

Learning Objectives

On completion of this lesson you will be able to learn:
- about queries.
- different types of queries.

10.1.1 Query

- Tables store all the information in a database, but if you want to view only selected fields and records in the database, you use a query.
- A query extracts specific data from one or more tables based on search criteria.
- For example, you could create a query for the customer table that will list all customers according to the city they belong. Next page will show the output of such query.

A query is a way of extracting specific data or information from a database. As you know tables store all information in database, if you want to view only selected fields and records in a database, you use query. For example you can create a query for the students table which will view the students who got gp 5.

10.1.2 Types of queries in Microsoft Access:

There are five types of query in Access. They are:

- Select queries
- Action queries
- Parameter queries
- Crosstab queries
- SQL queries.

Select Queries

Select query is the simplest and the most common type of query. It retrieves data from one or more tables depending on what is needed and displays the result in a datasheet. Select query also use to group records and calculate sums, counts, averages, and other types of totals.

Action Queries

Database undergoes a specific action depending on what was specified in the query itself is known as action query. This can include such things as creating new tables, deleting rows from existing ones and updating records or creating entirely new ones. Action queries are very popular in data management because they allow for many records to be changed at one time.

There are four types of action queries:
- Append Queries: An append query add records from one or more tables to the end of one or more tables. For example, you have some new customers and a database containing a table of information on those customers. To avoid typing all this information into your own database, you can append it to your Customers table.
- Update Queries: An update query makes global changes to a group of records in one or more tables. For example, you can increase employee's salary by 20 percent for the people within a certain job category. With an update query, you can change data in existing tables.
- Delete Queries: A delete query deletes a group of records from one or more tables. Delete queries always delete entire records, not just selected fields within records. For example, you could use a delete query to remove products that are discontinued or for which there are no orders.
- Make-Table Queries: A make-table query creates a new table from all or part of the data in one or more tables. Make-table queries are helpful for creating a table to export to other Microsoft Access databases or a history table that contains old records. Making a backup copy of a table automatically by using a macro or code.

Parameter Queries

Instead of entering predetermined criteria, you want to prompt users when a query runs; you can create a parameter query. A useful feature of the parameter query is that it can be saved and used again and again whenever we want to ask the same question. When you run a parameter query Access displays dialog box prompting you for the parameter value. You can create a parameter query by enclosing a question in square brackets ([]). For example, if you want to create a parameter query that asks users which id you want to use from the Student's table, you would type [Which id?] on the Criteria line under the id column. When the query runs, Access will prompt the user for the answer to your question.

Crosstab Queries

You use crosstab queries to calculate and restructure data for easier analysis of your data. Crosstab queries calculate a sum, average, count, or other type of total for data that is grouped by two types of information one downs the left side of the datasheet and another across the top.

SQL Queries
An SQL query is created by using an SQL statement. When you create a query in query Design view, Access constructs the equivalent SQL statements behind the scenes for you. In fact, most query properties in the property sheet in query Design view have equivalent clauses and options available in SQL view. If you want, you can view or edit the SQL statement in SQL view. However, after you make changes to a query in SQL view, the query might not be displayed the way it was previously in Design view.

Exercise

1.   *Multiple choice questions*

a.   How many types of queries have in Microsoft Access?

i)   4
ii)   5
iii)   6
iv)   3.

b.   Which query allow many records to be changed at one time instead of single record

i)   action query
ii)   select query
iii)   parameter query
iv)   crosstab query.

2.   *Analytical questions*

1.   What is query? Write the names of all types of query.
2.   Discuss about action query.
3.   Discuss about SQL query.

Lesson 10.2: Creating Microsoft Access Queries

Learning Objectives
On completion of this lesson you will be able to learn:

- creating query.
- saving query.
- retrieving all records and all fields.
- retrieving single column.
- retrieving multiple columns.
- creating parameter query.

10.2.1 Creating Queries
Open Tables or Queries in Query Design View
A query can be based on tables or on other queries. To create a query, you open the tables or queries on which you are going to base your query in Query Design view, and then use the options in Design view to create your query. You then click the Run button to display the results. You can save queries for later use.

To open tables or queries in Query Design view:
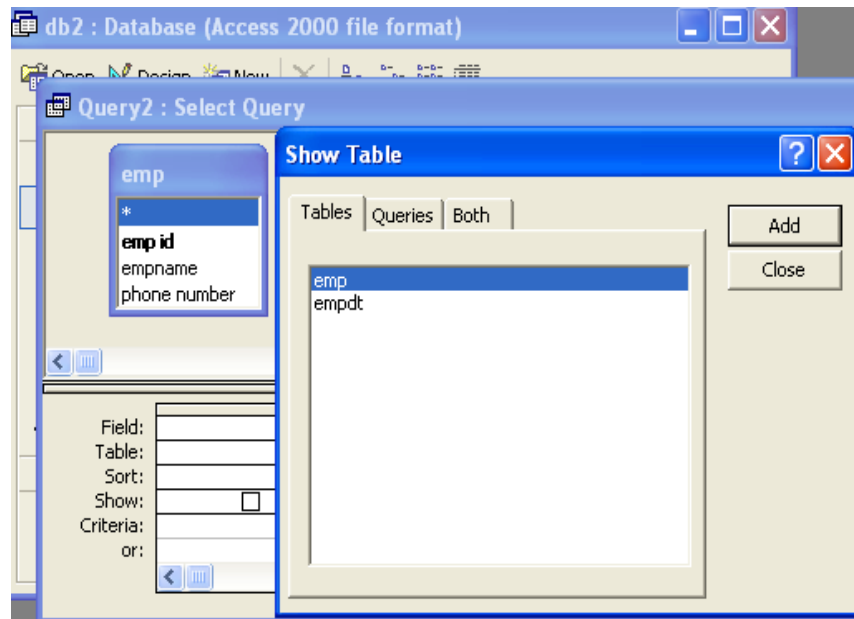
1. Activate the Create tab.

2. Click the Query Design button in the other group. The Show Table dialog box appears.

3. Activate the tables tab if you want to base your query on tables, activate the Queries tab if you want to base your query on queries or

activate the both tab if you want to base your query on both tables and queries.

4. Click to choose the table or query on which you want to base your query.

5. Click Add. The table appears in the window.

   ▪ Click to choose the next table or query on which you want to base your query.

   ▪ Continue clicking tables or queries until you have all the tables and queries you plan to use.

6. Click Close. Access changes to Query Design view.

10.2.2 To save a query:
1. Click the Save button on the Quick Access toolbar. Access saves the query unless you are saving for the first time. If you are saving for the first time, the Save As dialog box appears.

2. Type the name you want to give your query.

3. Click OK. Access saves the query. You can now access the query by using the Navigation pane.

You can also save by right-clicking a query's tab and then selecting save from the menu that appears. Access saves the query unless you are saving for the first time. If you are saving for the first time, the Save As dialog box appears. Type the name you want to give the query and then click OK. Access saves the query. You can now access the query by using the Navigation pane.

10.2.3 Retrieve All Records and All Fields
In Query Design view, each table has an option that allows you to display all of the fields and all of the records in a table. This option appears on the field line on the drop-down menu as the table name followed by a period and an asterisk (tablename.*).

To display all records and all fields:

1. Open query in Query Design view.

2. Click the down-arrow in the first field on the Field row (   ) and then select the tablename.* (emp. *) option. The table name appears on the table line.

3. Click the Run (   ) button. Access retrieves all of the fields and records for the table and displays them in Datasheet view like as follows.
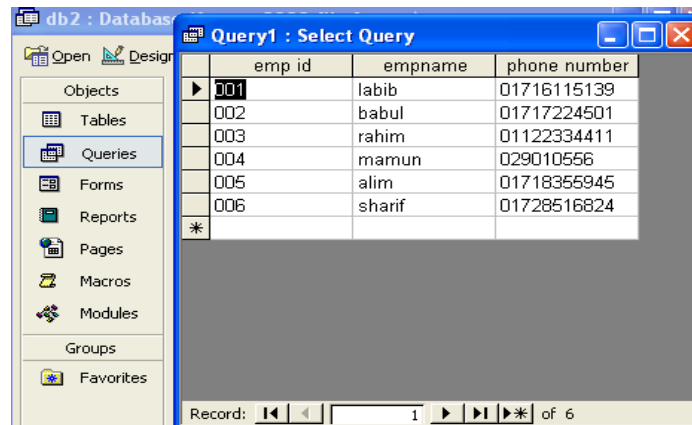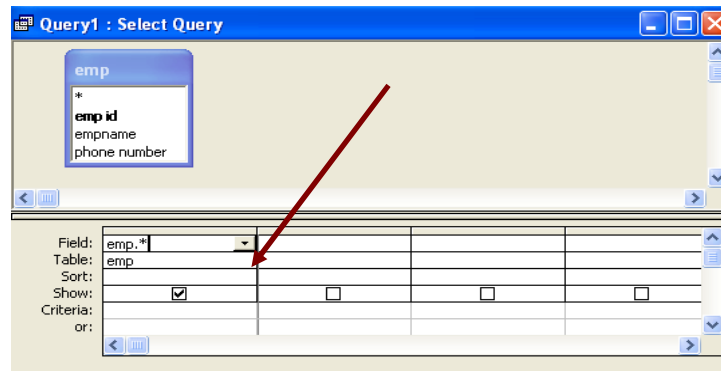
10.2.4 Retrieve a Single Column

You can use an Access query to retrieve a single column of data. Instead of choosing the tablename.* option on the Field line in Query Design view, choose the name of the field you want to retrieve.

To retrieve a single column:
1. Open query in Query Design view.
2. Choose the field name you want to display in the field line.
3. Select the Show button for the columns you do not want to display
4. Click the Run button. Access retrieves the column you chose.
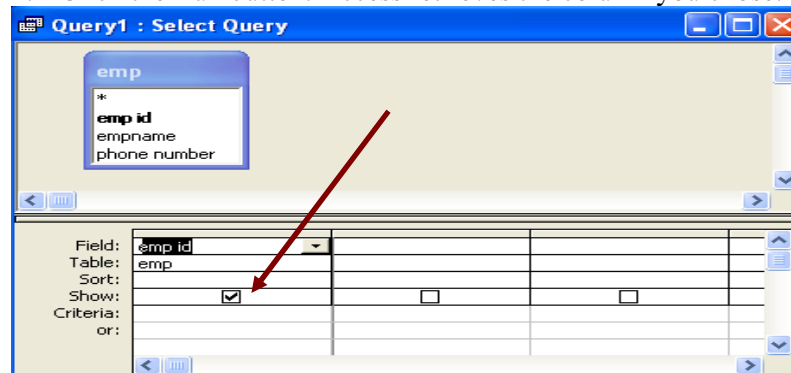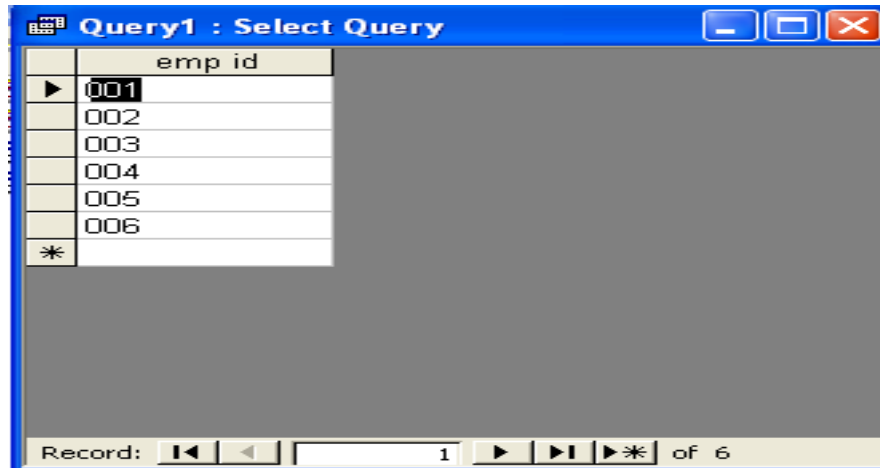
10.2.5 Retrieve Multiple Columns

You can use an Access query to retrieve multiple columns of data. On the Field line in Query Design view, choose the field name of each field you want to retrieve in the order you want to retrieve them.

To retrieve multiple columns:

1. Open query in Query Design view.

2. Choose the field names you want to retrieve in the order you want to retrieve them.

3. Click the Run button. Access retrieves the columns you chose.
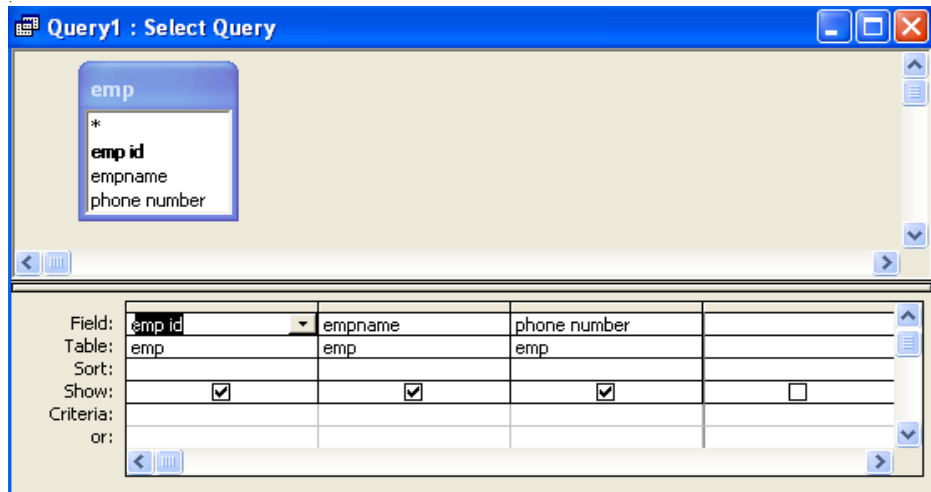
10.2.6 Creating a Parameter Query

To create a parameter query:
1. Open a table or query in Query Design view.
2. Create your query.
3. On the Criteria line, type the prompt within square brackets.
4. Click the Run button. Access prompts you. Dialog box that allows you to enter yours query parameter.

5. Respond to the prompt.
6. Click OK. Access displays the results of your query in Datasheet view.
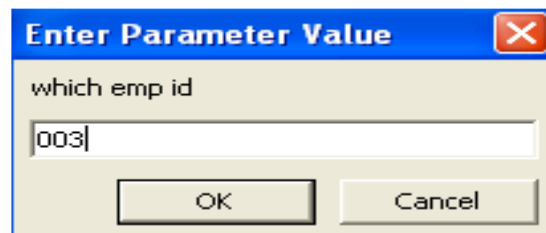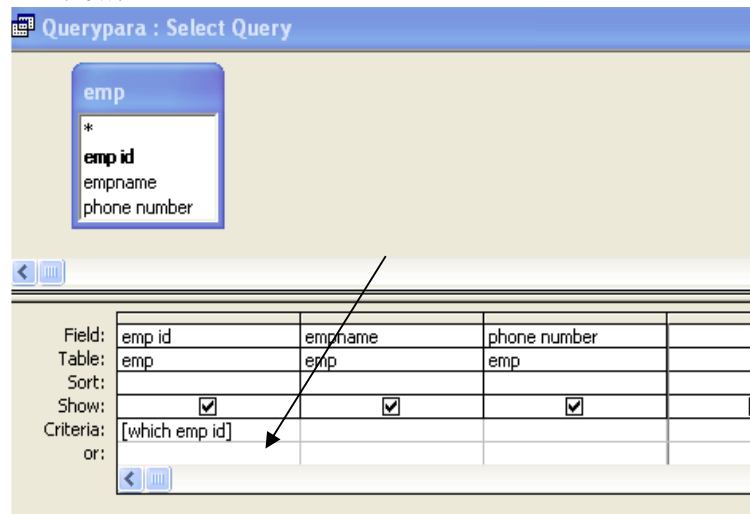
You can have as many parameters as you like in a single query. For example, you can design it to prompt you for two values. Access can then retrieve all records that fall between those two values. In this example the query would display all the record which contained employee id in the range 001 to 004.
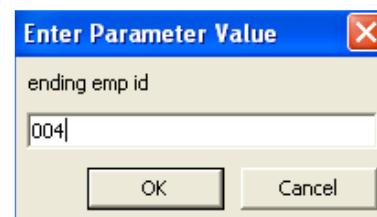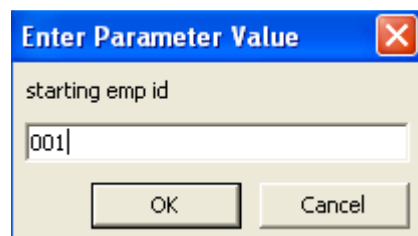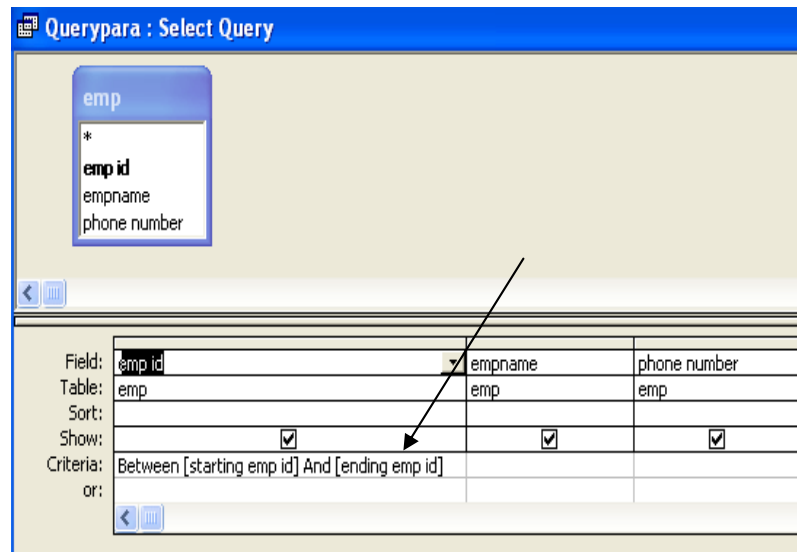
After performing result looks as follows

Note: If you want to make your user prompt more flexible, use one of the following formats.

Like "*" & [Prompt] & "*"	Returns all records that contain the value you enter. Example: If you enter ad, Access returns all records that include the sequence ad anywhere in the field.
Like "*" & [Prompt]	Returns all records that end with the value you enter. Example: If you enter S, Access returns all records that end with S.
Like [Prompt] & "*"	Returns all records that begin with the value you enter. Example: If you enter S, Access returns all records that begin with S.
> [Prompt] Note: You can also use < (less than) ,<= (less than or equal to) >=, >= (greater than or equal to), or <> (not equal)	Find all records with a value greater than the value you enter. Example: If you enter 5, Access returns all records that are greater than 5.

Exercise

1. *Multiple choice questions*

a.   Which format returns all records that end with the value you enter?

i)   like "*" & [Prompt] & "*"
ii)   like "*" & [Prompt]
iii)   like [Prompt] & "*"
iv)   > [Prompt].

b.   How you can create a parameter query?

i)   by enclosing a question in []
ii)   by enclosing a question in ()
iii)   by enclosing a question in {}
iv)   none of the above.

2. *Analytical questions*

1.   What is parameter query? How you can create parameter query?

2.   Write the steps required to create query?
3.   Write the steps required to display all records and all fields?

Lesson 10.3: Advanced Queries

Learning Objectives

On completion of this lesson you will be able to learn:

- logical operators.
- retrieving specific records.
- sorting query.
- modifying query
- query to make table.

10.3.1 Logical Operators

The logical operators and their meanings are shown in the table below.

Logical Operators			
Operator	Meaning	Field Type	Entry Format
=	Equal to	Character Number Date	= "abc" = 5 = #11/12/10#
<>	Not equal to	Character Number Date	<> "ab" <> 5 <> #11/12/10#
>	Greater than	Character Number Date	> "abc" > 5 > #11/12/10#
>=	Greater than or equal to	Character Number Date	>= "abc" >= 5 >= #11/12/10#
<	Less than	Character Number Date	< "abc" < 5 < #11/12/10#
<=	Less than or equal to	Character Number Date	<= "abc" <= 5 <= #11/12/10#
In	Equal to any item in a list	Character Number Date	In ("ab", "fg") In (5, 17) In (#11/12/10#, #22/12/10#)
Not In	Not equal to any item in a list	Character Number Date	Not In ("ab", "fg") Not In (5, 17) Not In (#11/12/10#, #25/12/10#)

Between	Between two values, greater than or equal to one and less than or equal to the other	Character Number Date	Between "C" And "F" Between 5 And 10 Between #11/12/10#, #29/12/10#
Not Between	Not between two values	Character Number Date	Not Between "C" And "F" Not Between 5 And 10 Not Between #11/12/10#, #29/12/10#
Is Null	The value is missing from the field	Character Number Date	Is Null Is Null Is Null
Is Not Null	The value is not missing from the field	Character Number Date	Is Not Null Is Not Null Is Not Null
Like	Like a specified pattern. * means any series of characters. ?means any single character.	Character Number Date	Like "a*" Like "1*" Not Applicable
Not Like	Not like a specified pattern. * means any series of characters. ? means many single character.	Character Number Date	Not Like "a*" Not Like "1*" Not Applicable

10.3.2 Retrieving Specific Records using Criteria:

So far, you have been retrieving all of the records (rows) in our table. However, you can specify which records you wish to retrieve.

For example, you can retrieve only the employee whose employee id number is 005, or employee name is mamun or only those whose date of birth is 29/12/80. For this we use logical operators such as = (equal), < > (not equal), > (greater than), or < (less than). For example, to display employee name mamun enter ="mamun" in the empname column on the Criteria line. Access will only retrieve records where the value in the empname column is equal to "mamun". Selection criteria are not case-sensitive, so Access will retrieve records where the entry is MAMUN,mamun, Mamun, or mAMun.

When using the Like and Not Like criteria, where you place the asterisk (*) or question mark (?) determines the type of searching Access performs.

Like "Ma*" finds all records in the field that begin with Ma. It would find Mamun, Manik, and Male.
Like "*ny" finds all records in the field that end with ny. It would find jony, rony, and sony.Like "*123*" finds all records that contain 123

anywhere in the field. It would find 422123789, 123456789, and 78945123.

The sequence Like "?oy" finds all three character field entries where the second and third characters are oy. It would find Boy, Toy, and Joy.

The sequence Like "Jo?" finds all three character field entries where the first and second characters are Jo. It would return Joe, Joy, and Jon.

The sequence Like "T?m" finds all three character field entries where the first and third characters are T and m. It would return Tim, Tom, and Tam.

To retrieve specific records using criteria:

1. Open a query in Query Design view.

2. Select the Show button for columns you do not want to display.

3. Enter your selection criteria on the Criteria line.

4. Click the Run button. Access retrieves the columns you chose and displays the rows.
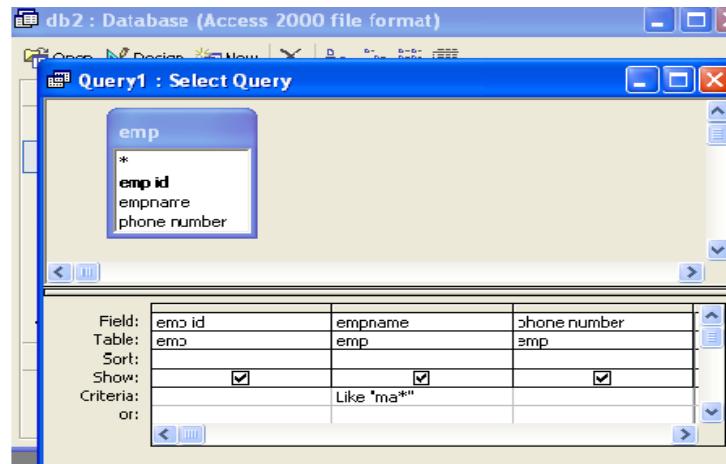
After retrieving specific records looks like as follows:
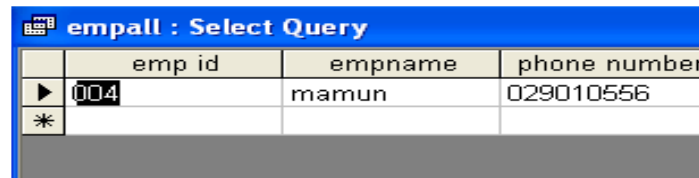
10.3.3 Retrieve records using Multiple Criteria

You can apply multiple criteria to the same table. If you place two criteria on the same line, Access will only retrieve records where both criteria are met. For example, if you want all records where the empname Like "Ma*"   and the phone number is equal to 029010556, you would

set the empname field to = "Ma*" and the phone number field to = "029010556" and you would place both criteria on the same line.

If you place one set of criteria on the Criteria line and the second set of criteria on the Or line, Access will retrieve records if either criteria are met. For example, you want all records where the employee name is equal to "mamun" or the employee name is equal to labib or the phone number is equal to 01717224501. You would set the empname field to = "mamun" ,or empname field to="labib"and the phone number field to = "01717224501" and you would place one set of criteria on the Criteria line and the other set of criteria on the Or line. Access will display all records where the employee name equals mamun or labib or Phone number is equal to 01717224501. You can add additional and , or statements by using the lines below the Or line. For And clauses, place the criteria on the same line; for Or clauses, place the criteria on separate lines.

To apply multiple criteria:
1. Open a query in Query Design view.
2. Select the Show button for columns you want to display.
3. Enter your selection criteria on the Criteria line and or line as needed.
4. Click the Run button. Access retrieves the columns you chose and displays the rows.

To retrieve record if either criteria is true:

To retrieve records if both criteria are true:

If the both criteria are true the result will be as follows:

If the both criteria are not true then none record will be retrieve.

10.3.4 Sorting Query

When creating a query, you can sort the rows you retrieve in ascending or descending order by choosing the option you want on the Sort row in Query Design view.

To Perform a Sort:

1.   Open query in Query Design view.

2.   Choose the field names you want to retrieve in the order you want to retrieve them.

3. Under the field you want to sort, click the down-arrow and then choose Ascending or Descending.

4. Click the Run button. Access retrieves the columns you chose and displays the rows in the order you specified.
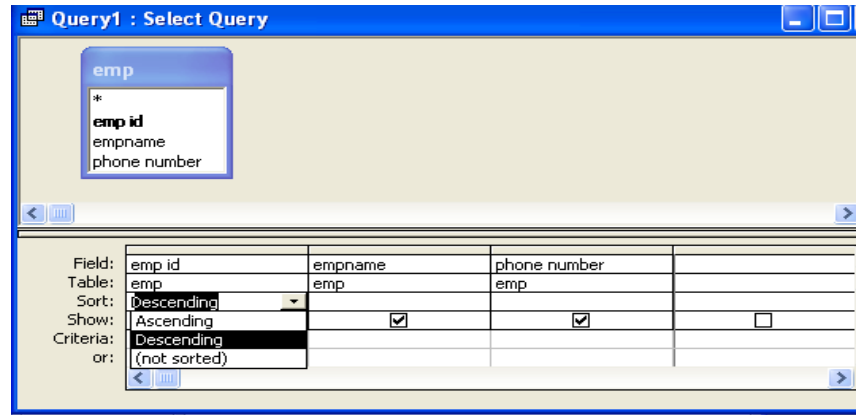
10.3.5 Modify a Query

Once a query is created, it can be modified. To modify query simply open the query in Query Design view and make the changes. You can add columns, change the sort order, change the criteria, and make other changes.

Use the Insert Columns button to insert a column. Click anywhere in the column before which you want to insert a column and then click the Insert Column button.

Use the Delete Rows button to delete a row in the criteria area. Click anywhere in the row you want to delete and then click the Delete Row button.

Use the Delete Columns button to delete a column. Click anywhere in the column you want to delete and then click the Delete Column button .

10.3.6 Query to Make a Table

You can use a query to create a table. This is useful when you want to create a new table that includes the fields and data from an existing table. To create a table:

1. Open the table or query on which you want to base your new table on in Query Design view.
2. Enter the criteria on which you want to base your new table.
3. Click the Make Table button. The Make Table dialog box appears.
4. Type the name you want to give your new table.
5. Click OK.
6. Click Run.
7. Click Yes.
8. Close the query. (Right-click the query's tab and then click Close.)
9. Double-click the new table's name in the Navigation pane to view the new table.
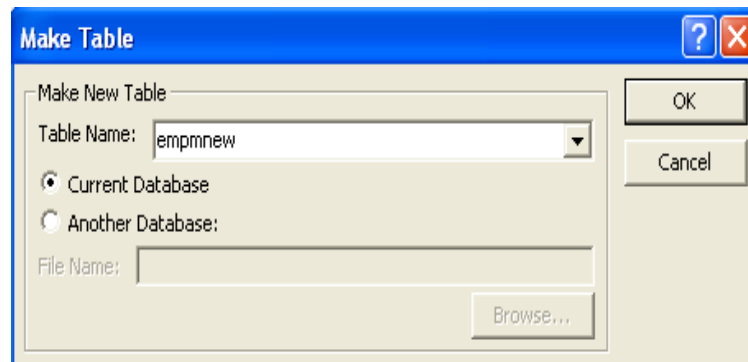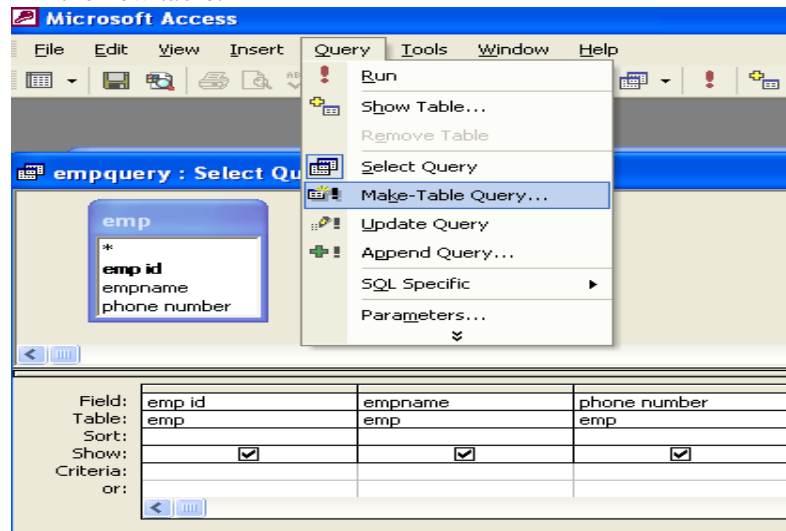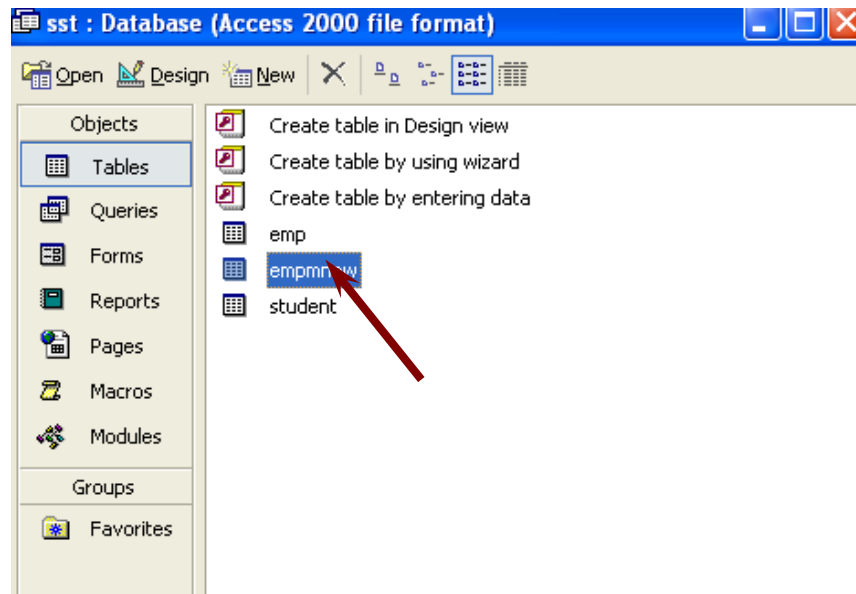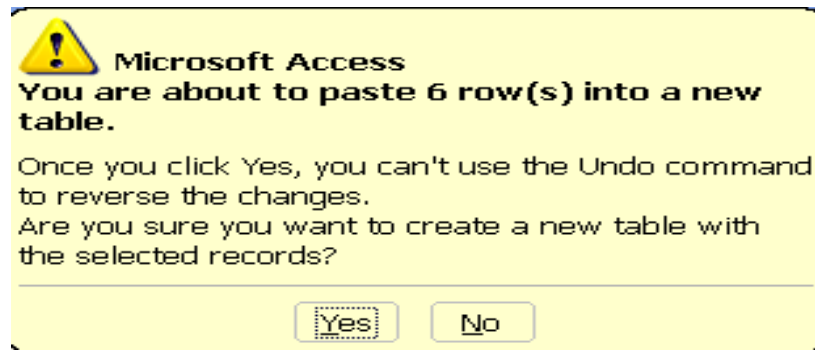
Exercise

1. *Multiple choice questions*

a.   Selection criteria are

i)   case sensitive
ii)   not case sensitive
iii)   any one of the above.
iv)   none of the above.

b.   Like "J?m" finds which three character

i)   Jim
ii)   jam
iii)   joy
iv)   both i and ii.

2. *Analytical questions*

1.   Discuss about retrieving data using multiple criteria.
2.   How you can modify a query?
3.   How you can create a table using query and when it is useful?

Hands on Practice

1.

a)   Create a table containing 3 columns and 5 rows and save the table as sst.

b)   Create a query to retrieve all records and fields.

c)   Retrieve specific records using criteria.

d)   Sorts records in ascending order.

e)   Create a table as bou using query.