

Chapter 6

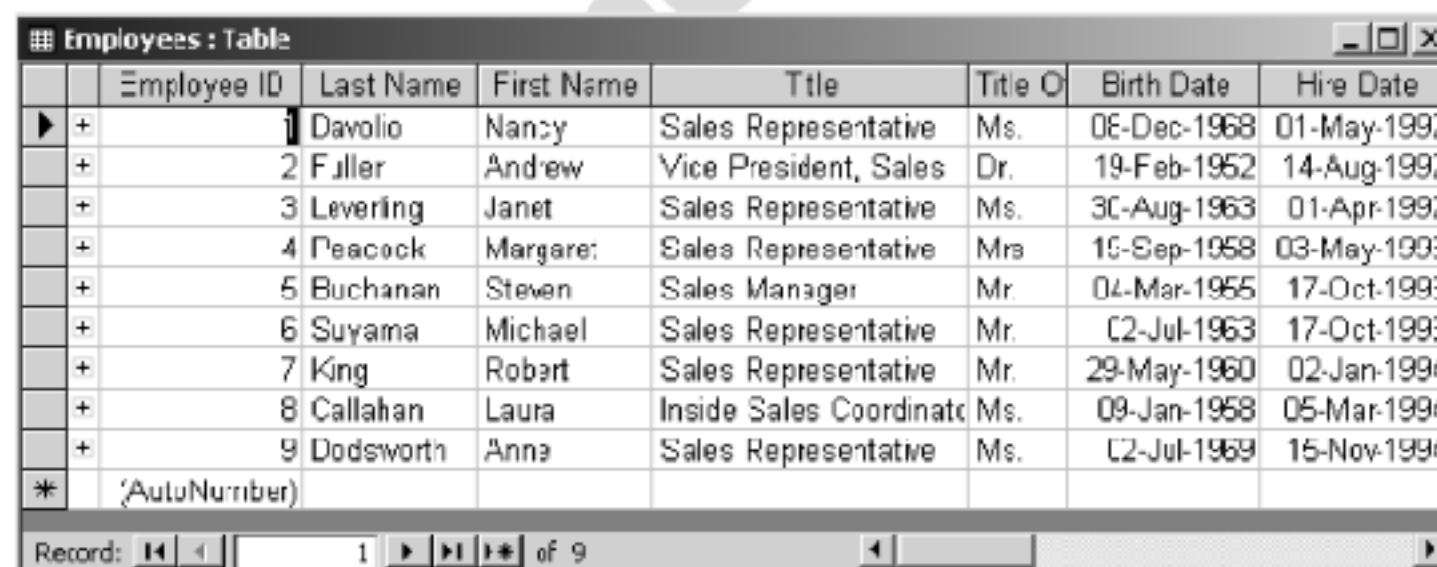
TABLE AND QUERY

Q1. What is table? Also discuss its different characteristics.

Ans.

Table

- o Table is the fundamental object of relational database.
- o It is called relation in database terminology.
- o Table is a collection of rows and columns.
- o Each intersection of row and column is called a cell.
- o Cell is the place where data is placed. Table has a lot of rows and columns.
- o Each row contains a tuple and each column represents an attribute of an entity.
- o Table or relation itself represents an entity.



The screenshot shows a database window titled 'Employees : Table'. It displays a table with the following columns: Employee ID, Last Name, First Name, Title, Title O, Birth Date, and Hire Date. The table contains 9 records. The first record is for Nancy Davolio, a Sales Representative, born on 06-Dec-1968, hired on 01-May-1992. The last record is for Anna Dodsworth, a Sales Representative, born on 02-Jul-1969, hired on 15-Nov-1994. The table is currently showing record 1 of 9.

Employee ID	Last Name	First Name	Title	Title O	Birth Date	Hire Date
1	Davolio	Nancy	Sales Representative	Ms.	06-Dec-1968	01-May-1992
2	Fuller	Andrew	Vice President, Sales	Dr.	19-Feb-1962	14-Aug-1992
3	Levering	Janet	Sales Representative	Ms.	30-Aug-1963	01-Apr-1992
4	Peacock	Margaret	Sales Representative	Mrs	16-Sep-1958	03-May-1993
5	Buchanan	Steven	Sales Manager	Mr	04-Mar-1955	17-Oct-1993
6	Suyama	Michael	Sales Representative	Mr.	02-Jul-1963	17-Oct-1993
7	King	Robert	Sales Representative	Mr.	29-May-1960	02-Jan-1994
8	Callahan	Laura	Inside Sales Coordinator	Ms.	09-Jan-1958	05-Mar-1994
9	Dodsworth	Anna	Sales Representative	Ms.	02-Jul-1969	15-Nov-1994

Characteristics of tables / Relation:

The tables of relational database have the following characteristics.

- o Each cell of the table contains only one value.
- o Each column has a distinct name. It is the name of the attribute or field it represents.
- o Each column is specified with a data type.
- o The order of the columns is immaterial.
- o Each row represents a record.

- o Each row is distinct. There are no duplicate rows.
- o The order of rows is immaterial.
- o Every entity is converted into corresponding table.
- o In this way data about one entity is stored at only one place which avoids redundancy.

Q2. Define the following terms. Degree of a relation, Cardinality of a relation, Database, Object, Table, Field, Record, Design View and Datasheet view.

Ans.

Degree of a relation:

- o The number of fields of a relation is called the degree of that relation.
- o A table's degree is specified at the time of its creation.
- o But as a rule it can be changed at any time. Change in degree of a table may cause data loss.

Cardinality of a relation:

- o The number of records in a relation is called the cardinality of that relation.
- o Cardinality of a table changes as new records are added or previous records are deleted.
- o For example a table having 40 rows/records has cardinality 40.

Basic Terminologies:

Here are a few words frequently used in MS-Access.

Database: Database is a collection of related records.

Object: Object is a component of database e.g. table, form, query and report.

Table: A table is a collection of related data arranged in the form of rows and columns. Tables with common fields can be linked together to form relationships.

Field: Field is a column in a table. A data type is defined for each field. Field represents the attribute of the entity.

Record: Record is a row of table. It is a collection of attributes.

Design View: This view is used to design the new table or edit existing table structure.

Datasheet View: this view allows user to view, edit and add data in the table.

Q3. What is MS-Access IDE? Also discuss different views of a table in MS-Access.

Ans.

Access IDE

- o IDE stands for Integrated Development Environment.
- o It is a collection of facilities provided to the users.
- o It is used by database designers and application programmers.
- o It is used to create database and database applications.
- o IDE uses a graphical interface.
- o The users do not create database applications manually.
- o The details of database creation are hidden from the user.

Starting Microsoft Access

From task bar on desktop

Press Start button → Programs → Microsoft Access

OR

From desktop double click the Microsoft Access icon if it is present over there.

Table Design View

- o The view that is used to design the structure of a table is called design view.
- o It is used to specify name, data types and description of fields.
- o Primary key is also specified in this view.
- o The structure of an existing table can also be modified in design view.

The screenshot shows the 'Student : Table' design view in Microsoft Access. The table has five fields: RollNum (Number), Name (Text), Address (Text), Phone (Text), and Class (Text). The 'Field Properties' pane is open, showing the 'General' tab for the 'RollNum' field. The properties are: Field Size (Long Integer), Format (empty), Decimal Places (Auto), Input Mask (empty), Caption (empty), Default Value (0), Validation Rule (empty), Validation Text (empty), Required (No), and Indexed (Yes (No Duplicates)). A note on the right states: 'A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.'

Field Name	Data Type	Description
RollNum	Number	
Name	Text	
Address	Text	
Phone	Text	
Class	Text	

Field Properties

General	Lookup
Field Size	Long Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	
Default Value	0
Validation Rule	
Validation Text	
Required	No
Indexed	Yes (No Duplicates)

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Table Datasheet View

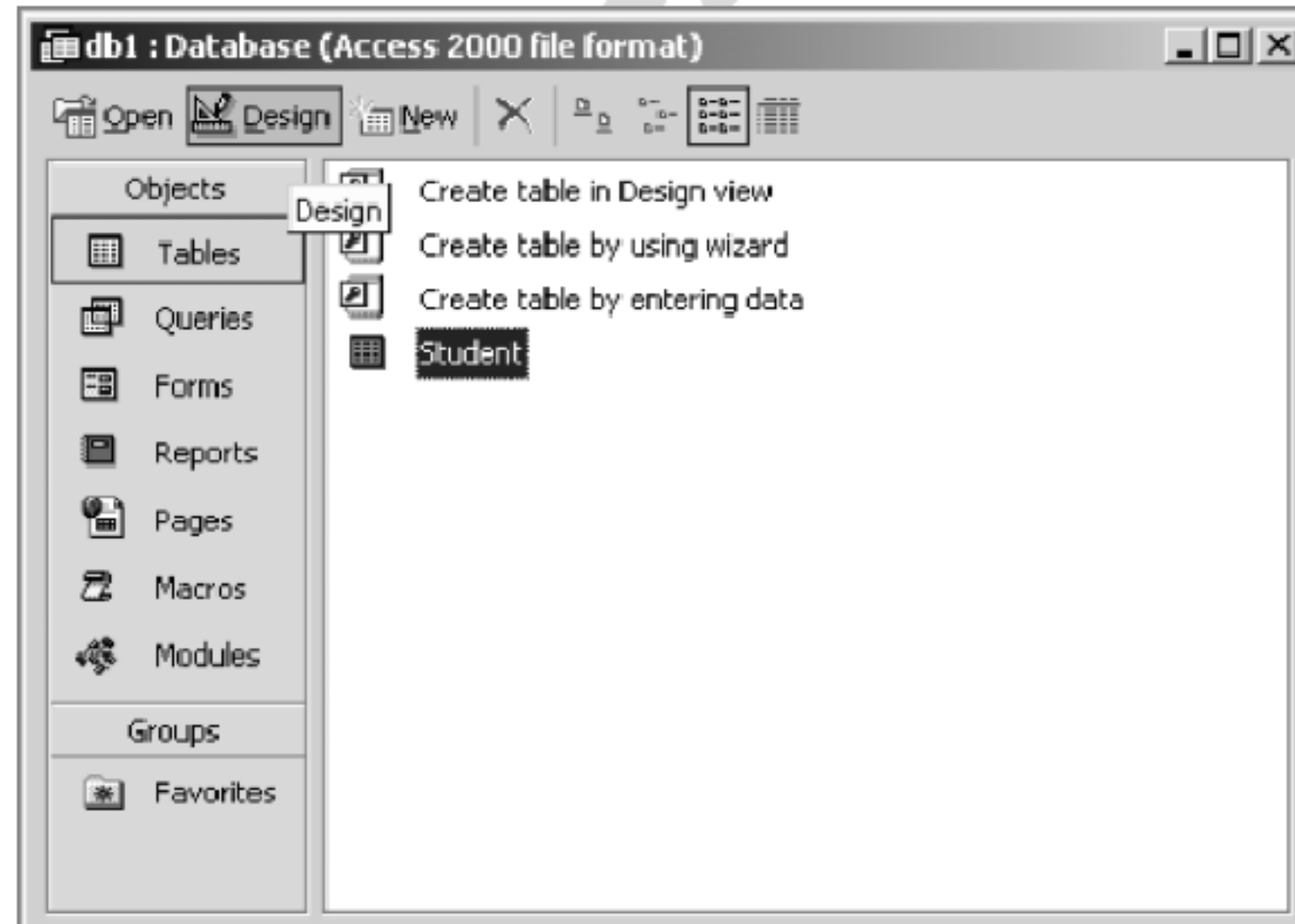
Table view that is used to insert, delete or modify data in a table is called datasheet view. The table in this view is displayed in rows and columns. The name of each field is displayed at the top of the column. Data can be manipulated in the following forms.

	RollNum	Name	Address	Phone	Class
▶	1	Adnan	Lahore	7456	ICS
	2	Qasim	Karachi	5478	I.Com
	5	Kashif	Gujranwala	6524	B.Com
	6	Ali	Lahore	3245	ICS
*	0				

Record: 1 of 4

Switching between views

To switch views from datasheet to design view just click the button at top left corner of the window.



OR

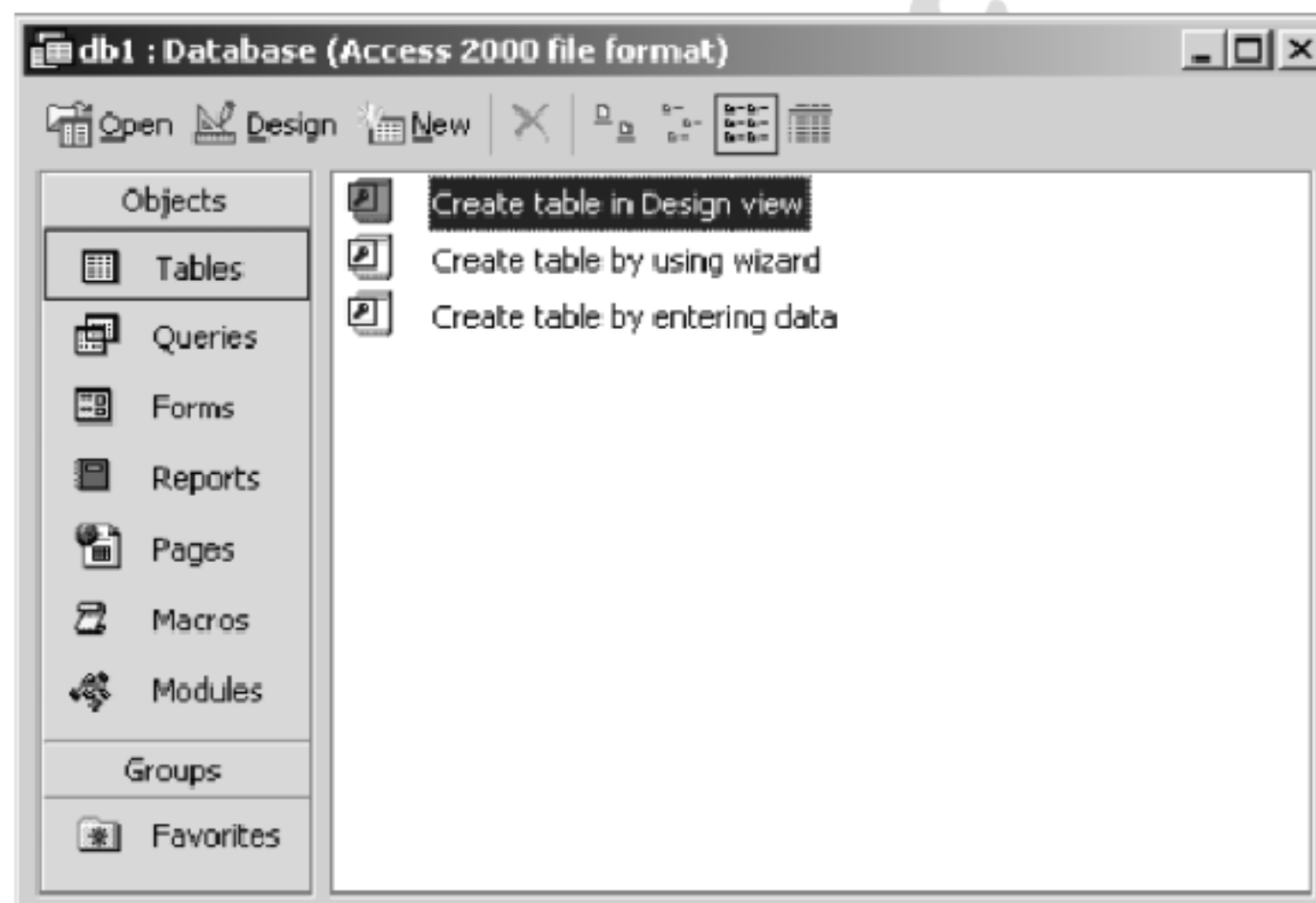
Right click the table object and choose open for datasheet view and design view to open in the design in the design view.

Q4. How tables are created in Design View? Write stepwise procedure.**Ans.**

- o Microsoft Access like other databases allows users to create and manage tables using its IDE.
- o A large amount of tables can be created using Microsoft Access.
- o All the tables have unique name with in the database.
- o Each table can have multiple columns representing the attributes of an entity.
- o Each column required to have unique name with in the table.
- o Each column need to be specified a data type, which tells that what type of data can be stored in that column.

Table Creation

Table can be created in different ways in Microsoft access.



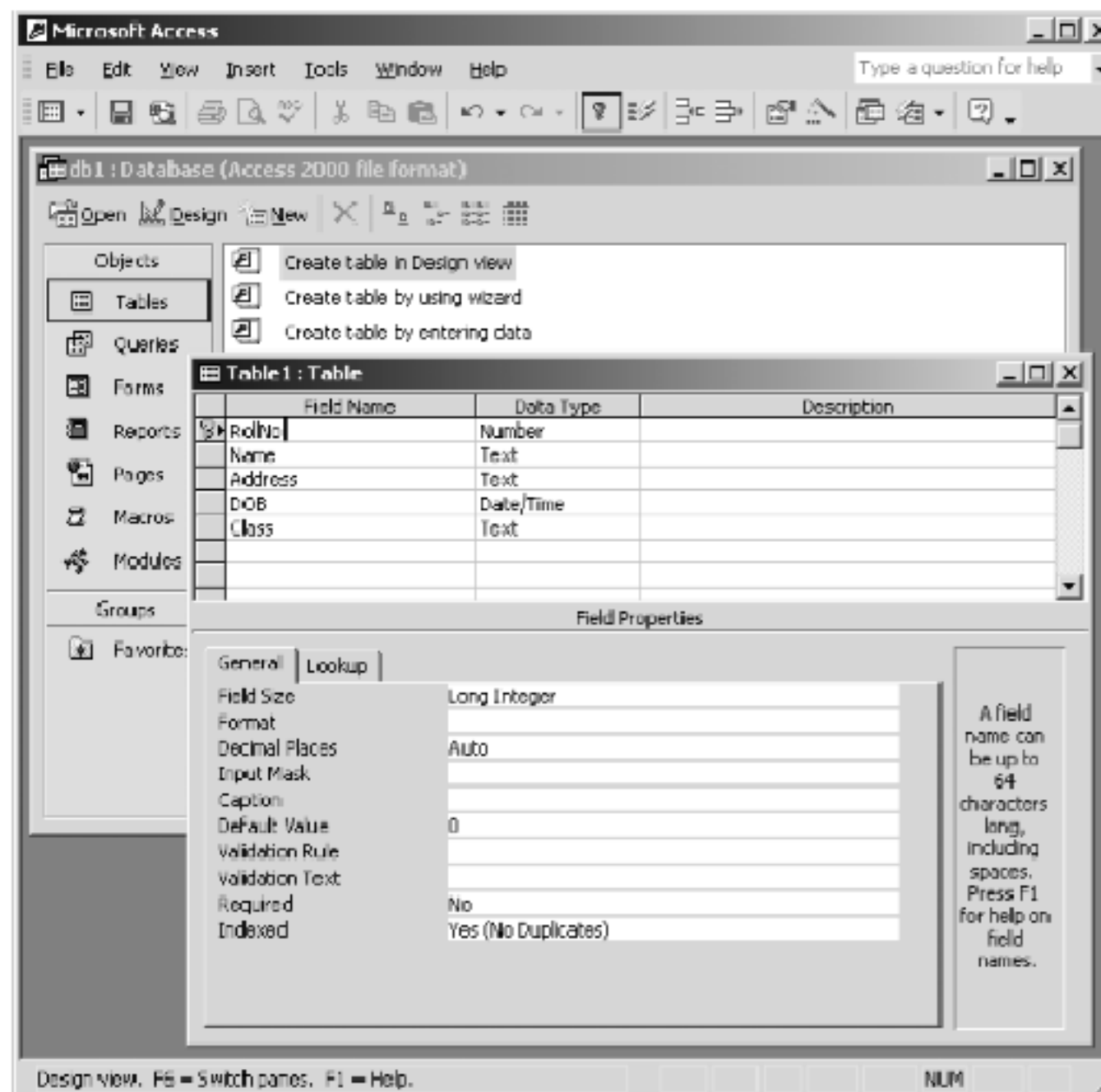
Here are three methods to create a table.

- Create table in Design View.
- Create table by Using Wizard
- Create table by Entering Data

Creating Table in Design View

1. From objects pane on left side click on the tables object.
2. There will be three options on the right pane.

3. Select the first option of “create table in design view” and double click it.
4. A blank table will open in design view.
5. Write field name, their data type.
6. Under the description column enter the text that describes the field. It is optional.
7. The data type tells us that what kind of data we can store in that column or attribute.
8. Primary key can be set by just selecting the field and pressing the primary key button in toolbar.



Field name

- o This is the name of the field.
- o It must be self explanatory e.g. name should represent name.
- o The name cannot exceed 64 characters.

Data type

- o Before defining a field we must think of data that the field will contain e.g. name can contain characters, date of birth can contain date etc.
- o Data types available in MS-Access are in Text, Memo, Number, Date/Time, Currency, Auto Number, Yes/No, OLE Object and Hyper Link.

Q5. What are the different data types available in MS-Access?**Ans.****Text**

- o It is the default data type.
- o It can contain text or combinations of text and numbers, as well as numbers that don't require calculations, such as phone numbers.
- o Its size is 255 characters or the length set by the FieldSize property, whichever is less.
- o Microsoft Access does not reserve space for unused portions of a text field.

• Memo

- o A text type field that can contain more than 64000 characters.
- o It is used for long descriptions.

• Number

- o Numeric data used in mathematical calculations.
- o Size of this data type can be 1, 2, 4, or 8 bytes (16 bytes if the FieldSize property is set to Replication ID).

• Data/Time

- o A date, time or combination of both can be specified in this field.
- o Its size is 8 bytes.

• Currency

- o This data type can hold currency values and numeric data used in mathematical calculations.
- o It can manage data accurately 15 digits on the left side of the decimal separator and to 4 digits on the right side. Its size is 8 bytes.

• Auto Number

- o A unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table.
- o AutoNumber fields can't be updated. Its size is 4 bytes.

• Yes/No

- o This field can store two values either Yes/ No, True/False, or On/Off.
- o Its size is one bit.

- **OLE object**

- o An OLE (Object Linking and Embedding) object is a sound, picture, or other object such as a word document or excel spreadsheet that is created in another program.
- o This data type is used to embed or link an OLE object in the database.

- **Hyper Link**

- o This field contain text or combinations of text and numbers stored as text and used as a hyperlink address.
- o A hyperlink address can have up to four parts:
 - text to display — the text that appears in a field or control.
 - address — the path to a file or page (URL).
 - subaddress — a location within the file or page.
 - screen tip — the text displayed as a tooltip.General form of hyperlink is
Display text # address # subaddress# screen tip

Example:

Google Home Page#<http://www.google.com>#C:\my_documents\database.mdb#mytable

The easiest way to insert a hyperlink address in a field or control is to click Hyperlink on the Insert menu.

Description (optional)

The description is brief comments about the field.

Q6. How different field properties of a table are defined in MS-Access? Briefly describe them.

Ans.

Defining field properties in design view

- o Field properties can be defined in design view.
- o Field properties are used to define how data will be entered, stored and displayed in MS-Access.
- o Field properties can be defined in design view.
- o Design view window can be divided into two panes, a top pane and a bottom pane.
- o In top pane we enter the field name, its data type and description.

There is a long list of properties of fields but a few of them are briefly described.

- **Field Size**

- o You can use the FieldSize property to set the maximum size for data stored in a field set to the Text, Number, or AutoNumber data type.
- o The default field size for the text type is 50 characters.
- o The field size can be limited to a certain number of characters if the value in the field is small.
- o It saves disk space and prevents entry errors.

For number field following options are available.

Data Type	Data Range	Size in Bytes
Byte	0-255	1
Integer	-32768 to 32768	2
Long Integer	-2,147,483,648 to 2,147,483,648	4
Single	-3.4×10^{38} to 3.4×10^{38}	4
Double	-1.797×10^{308} to 1.797×10^{308}	8

- **Format**

- o The format property is used to specify the format of data as it is displayed.
- o The first part of the property is used to apply to the field and the second applies to empty fields.

Text and memo format

Following are the symbols used to format text and memo data type.

Symbol	Description
@	Must have a text character in this position
&	Optionally have a character in this position
<	All characters will be lower case
>	All characters will be upper case
Space	Display a space between characters
“ABC”	Display the characters inside the quotes “”

@\!

Adds character at the end

Table below shows the use of text format property and its result

Text Format			
Format	Datasheet Entry	Access Displays	Explanation
@@-@@@	12345	12-345	@ indicates a required character or space
@@-@@&	1234	12-34	& indicates an optional character or space
<	STUDENT	student	< converts characters to lowercase
>	Student	STUDENT	> converts characters to uppercase
@\!	Student	Student!	Adds characters to the end
@;"No Data"	Student	Student	
@;"No Data"	(Blank)	No Data	

Number format

- o Basic number format can be selected from the list box.

General Number	1234.874
Currency	\$123.45
Euro	€1,23.87
Fixed	324.65
Standard	3,45.65
Percent	234.00%
Scientific	4.56E+03

- o Decimal places to be displayed in a number can also be specified.
- o By default a number displays two decimal places.

- o In addition to using the predefined format, custom formats can also be specified using the symbols explained below.

Number Format			
Format	Datasheet Entry	Access Displays	Explanation
###,##0.00	123456.78	123,456.78	0 is a placeholder that displays a digit or 0 if there is none.
\$###,##0.00	0	\$0.00	# is a placeholder that displays a digit or nothing if there is none.
###,.00%	123	12.3%	% multiplies the number by 100 and added a percent sign

Currency format

- o The currency format consists of four parts separated by semicolons.
- o These are format for positive numbers, format for negative numbers, format for zero values and format for NULL values.

Currency Format	
Format	Explanation
\$##0.00;(\$##0.00)[Red];\$0.00;"none"	Positive value will be normal currency format, negative numbers will be red in parentheses, zero is entered for zero values, and "none" will be written for NULL values.

Yes/No

- o Fields are displayed as check boxes on the datasheet.
- o To change the formatting of these fields first click the look up tab and change the display control to the text box.
- o It has three parts, first does not contain anything, second specifies formatting for Yes and third for No values.

Yes/No Format

Format	Explanation
; "Yes" [green]; "No" [red]	Prints "Yes" in green or "No" in red

Date format

The date format is as follows

Currency Format		
Format	Access Display	Explanation
dddd", "mmmm d", "yyyy	Monday, January 5, 1991	dddd, mmmm, and yyyy print the full day name, month name and year.
ddd", "mmm "d", "yy	Mon, Jan. 1, 01	ddd, mmm, and yy print the first three day letters, first three month letters, and last two year digits.
"today is "dddd	Today is Monday	
h:n:s: AM/PM	12:00:00 AM	"n" is used for minutes to avoid confusion with months

Default Value

- o In some cases, the value of all records in a certain field is same.
- o A default value can be set in this case.
- o The user does not need to type the same value again and again.
- o The property **set the default value** is used to set default value for a field.

Indexes

- o The indexes are created to query and sort records faster in MS-Access.
- o The index property is used to set an indexed field.
- o The Yes (Duplicates Ok) is selected if multiple entries of same data value are allowed.
- o The Yes (No Duplicates) option prevents duplicates

Field Validation Rules

- o The validation Rules specify the criteria for the data entered in the worksheet.
- o A message can be displayed to the user if the data violates the rule.
- o Expression builder button at the end of validation rule box is used to write the rule.

Validation Text

- o Validation Text is the message that is displayed when the validation rule for a field is not followed.

Input Masks

- o An input mask controls the value of a record and set it in a specific format.
- o They are similar to the format property e.g. a telephone number field can be formatted with an input mask to accept ten digits in the form “(123) 456-7890”.
- o The blank field would look like (____)____-____. An input mask can be applied to a field by following these steps.

In design view select the field for input mask.

Click in the white space following input mask under the general tab.

Click the “...” button to use the wizard or enter the mask such as (@@@)@@@-@@@@, into the field provided.

Following symbols can be used to create an input mask.

Input Mask Symbols	
Symbol	Explanation
A	Letter or digit
0	A digit 0 through 9 without a + or – sign and with blanks displayed as zeros
9	Same as 0 with blanks displayed as spaces
#	Same as 9 with +/- signs
?	Letter
L	Letter A through Z
C or &	Character or Space
<	Convert letter to lower case
>	Convert letter to upper case

Q.7 What is an input mask? In how many ways can it be created?

Ans. Input Mask:

The input mask specifies the pattern for the data to be entered in a field. It is similar to the format. However, it also displays the format in datasheet view according to which data must be entered.

There are two ways of creating an input mask for a field. These are using the Input Mask Wizard and directly entering the input mask.

Creating Input Mask Using Wizard:

Input mask wizard works only with Text and Date fields. To add an input mask to a field using the Input Mask Wizard.

- o Open the table in the Design View.
- o Click on the field to which the input mask is to be added.
- o Click in the Input Mask property in the bottom of the Design View window. The ellipsis will appear next to the input mask text box.
- o Click on the ellipse  and Input Mask Wizard will open.
- o Select an appropriate mask from the box and click next.
- o Modify the mask, if necessary, in the input mask text box.
- o Select the desired placeholder from the dropdown list.
- o Click Next button to move to the next step.
- o Select whether or not the symbols are to be displayed.
- o Click Finish button to complete the wizard task.

Components of Input Mask:

An input mask consists of three parts. These parts are separated by semicolons (;).

- o The first part is the mask.
- o The second part consists of input mask characters. These characters specify the type of data that can be input in the field.
- o The third part specifies the placeholder. A placeholder is a character that is displayed in the field where data is to be entered. Each placeholder specifies one character of data. Placeholders are replaced when actual data is entered.

Input Mask Symbols	
Symbol	Explanation
A	Letter or digit
0	A digit 0 through 9 without a + or – sign and with blanks displayed as zeros
9	Same as 0 with blanks displayed as spaces
#	Same as 9 with +/- signs
?	Letter

L	Letter A through Z
C or &	Character or Space
<	Convert letter to lower case
>	Convert letter to upper case

Examples of Input Masks:

Mask	Field Data
(999)000-0000	(042) 921-1995
	() 756-7533
>LLL9999	LXD1112
>LL?9999	LH269
AAa	123
	12

Directly Entering Input Mask:

The Input Mask Wizard provides built-in masks for a few common fields. For example, it can be used only for date and text fields. If some other type of mask is to be entered, it has to be created by the user.

To create an input mask for a field without using the Wizard:

- o Open the table in Design View.
- o Click in the field for which the input mask is to be created.
- o Enter the input mask in the bottom half of the Design View. For example to enter an input mask for entering telephone numbers as 042-756-7533, the input mask is entered as: 000\000\0000;0;_

Q8. What is a primary key? How it is marked?

Ans.

Primary Key

- o Every record in a database table must be unique.
- o The uniqueness of a record is guaranteed by a field or a group of fields that contain unique values in the table.
- o This field or the group of fields is called the primary key of the table.

Steps:

- o Designate the primary key field by right clicking on the record and selecting primary key.
- o If none of the existing fields in a table produces unique values for every record, a separate field must be added.

After doing above all when you will save the work it will ask you to give name to the table. Give a meaningful name to the table and save it.

Q9. How to create a table using Wizard and by entering data?

Ans.

Creating Table Using Wizard

Microsoft Access wizard provides an easy way to create tables. It provides various table templates to create business and personal tables.

The following procedure is used to create a table using table wizard.

1. Open database window.
2. Click tables in objects pane.
3. Double click the second option **create table by using wizard**. The table wizard will start.



4. Choose the specific field for the table. Click on the business or personal option button. Sample table will appear.
5. Select the sample table and then its required fields using the arrow buttons.
6. Enter a name for your table and also set primary key.
7. If you want to relate your table with existing one, Access can create the relationship.

Creating Table by Entering Data

- o Microsoft Access provides the facility to create table by directly entering data.
- o This option provides a blank datasheet.
- o The user can enter data in cells and click save button.
- o It will prompt to add a primary key field.
- o The fields are given names such as field1, field2 etc. Names can be modified later by the user.

- o The data types of the fields are automatically specified according to the data entered in the table.

Q10. How to add, edit and delete records in a table?

Ans.

Adding Records

Data is entered into a table in datasheet view. To add data to a table

1. Open the table in datasheet view
2. Type the data in first field of first record.
3. After typing press enter button, the cursor will move to the next field.
4. Repeat the same for all fields.
5. When enter key is pressed in the last field of a record the cursor automatically moves to the first field of next record.

- **Editing Records**

To edit records, place the cursor in the record that is to be edited and make the necessary changes. Use the arrow keys to move through the record grid.

- **Deleting Records**

The records can be deleted from a table in datasheet view.

1. Open the table in datasheet view.
2. Right click on the record selector of the record that is to be deleted. The record will be selected and a pop up menu will appear.
3. Select delete record from the menu. A dialog box will appear to confirm deletion. Click yes to delete the record.

Q11. How to Insert and delete a field in a table?

Ans.

Inserting and Deleting Fields

The best option for adding new fields is the use of design view.

1. Select the column before which the new column is to be added by clicking its label at the top of the datasheet.
2. From insert menu select column

To delete a field

1. Select the column to be deleted by placing the cursor in it.
2. From edit menu select delete column.

Q12. How to Resize, Freeze and Hide rows and columns.?

Ans.

Resizing Rows and Columns

The height of a row on a datasheet can be changed.

- o The user can drag the grey sizing line between row labels up and down with the mouse. The height of all rows is changed.

The column width can also be changed.

- o The user can drag the sizing line between columns.
- o If user double clicks on line, it will expand the column according to the longest value in the column.

- **Freezing Columns**

- o To prevent a column from scrolling when the datasheet is scrolled is called freezing of the column.
- o When a column is frozen, it is always visible even when the datasheet is scrolled.

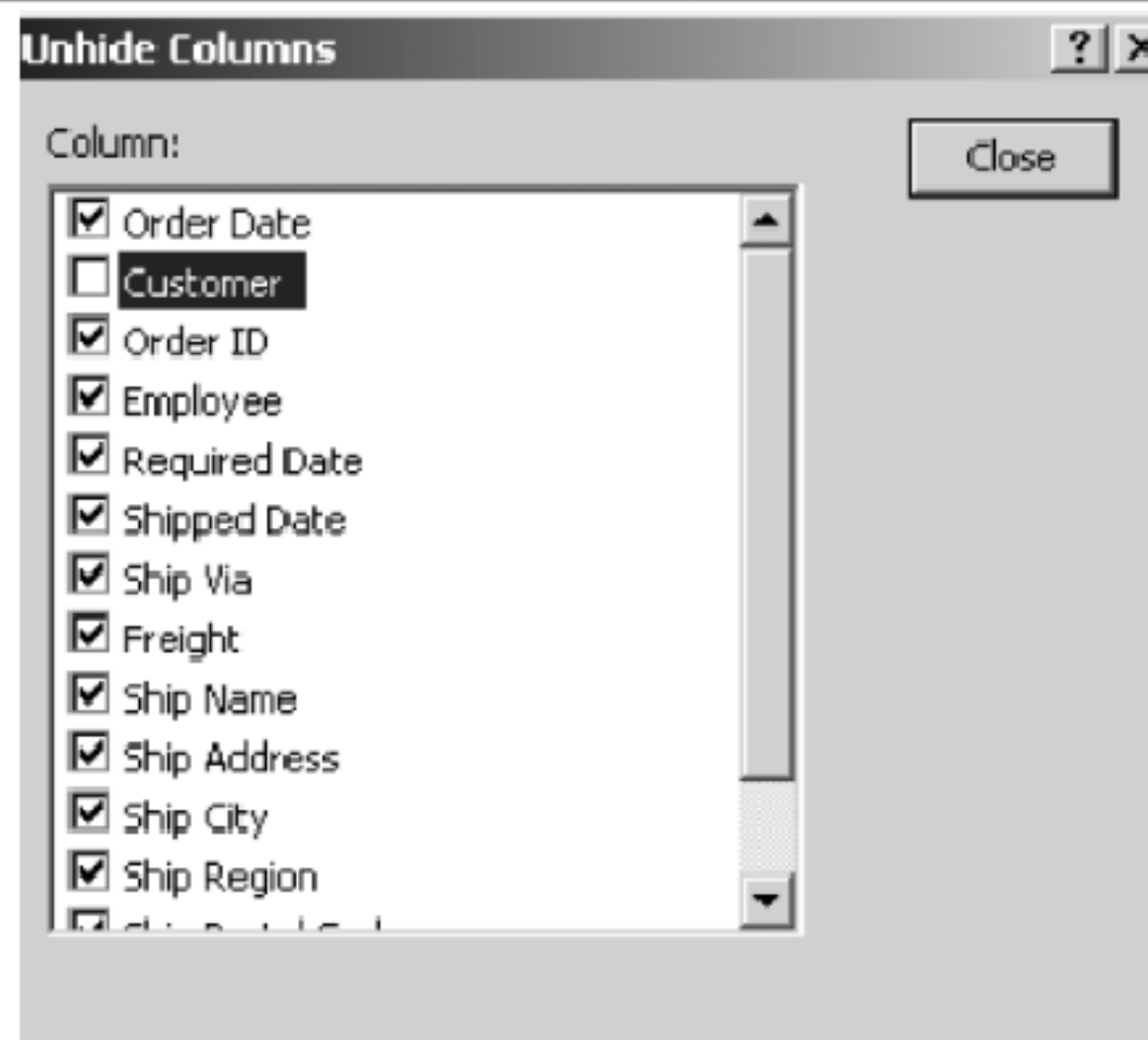
For example in a table that contains several columns, the leftmost column is not available to view when the datasheet is scrolled to the right. If this column is to be kept visible, it is frozen.

1. Click in any row in the column that is to be frozen.
2. Select **freeze column** from the **format** menu.
3. The frozen column becomes the left most column and a black line appears in the grid to the right of the last frozen column.

To unfreeze select **unfreeze all columns** from the **format** menu.

- **Hiding Columns**

Remove the column from view is called hiding columns. It is a temporary process.



1. Click in any row of the column that is to be hidden from view.
2. Select hide columns command from the format menu

To unhide column

1. Select **unhide columns** command from the **format** menu.
2. The **unhide columns** dialog box will be displayed.
3. The hidden columns are shown as unchecked in the dialog box.
4. Click the checkbox of the column that is to be displayed again and click the close button.
5. The column will be immediately displayed in the table.

Q13. How to find and replace data in a table?

Ans.

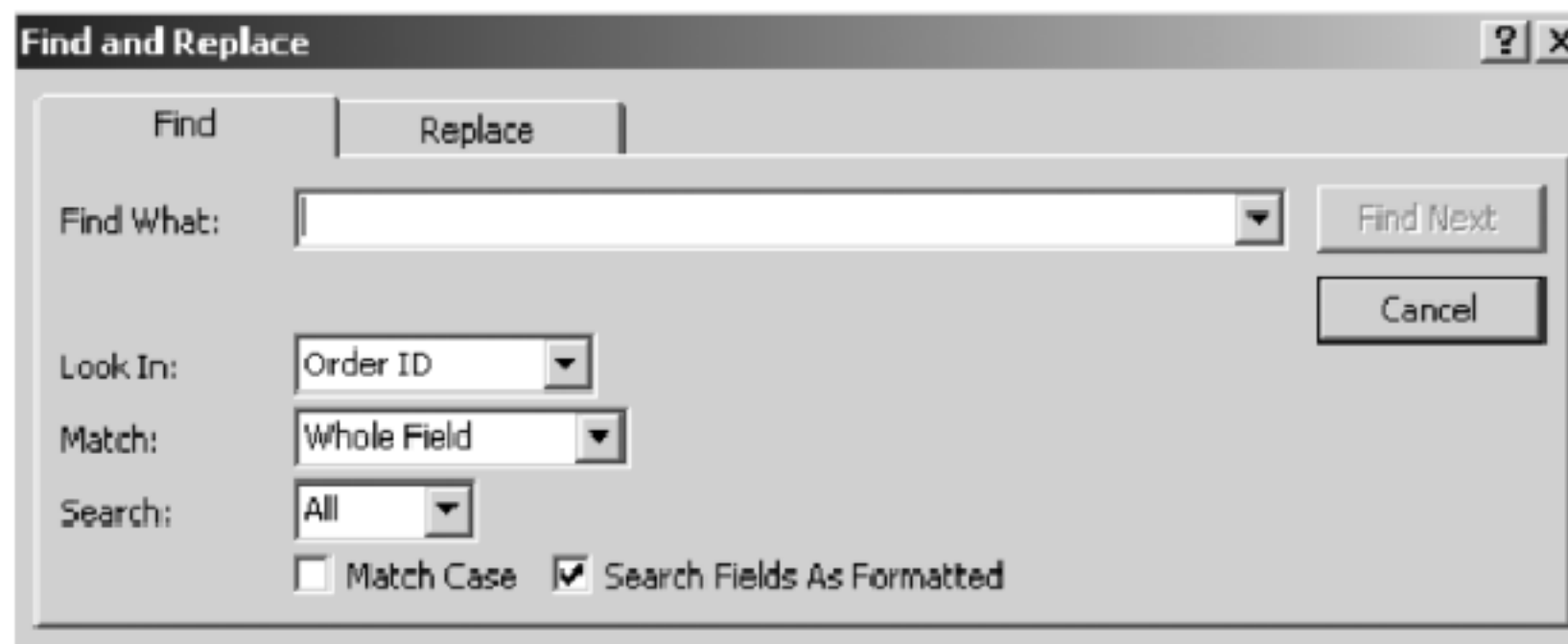
Find and Replace Data in a Table

Find option is available in Microsoft Access to find a particular data item. This option is available in edit menu. Using this option we can find required data item easily and even replace it with the data of our own choice.

Find

1. Open the table in datasheet view
2. Place the cursor in any record in the field that you want to search and select **Find** from the **Edit** menu.

3. Enter the value criteria in the **Find What** box.
4. From the **look in** drop-down menu select the field name.
5. Now select the matching criteria from **Match** and click the **More** button for additional search parameters.
6. After setting all criteria click the **find next** button. To find further records on same criteria keep clicking **find next** button.



Replace

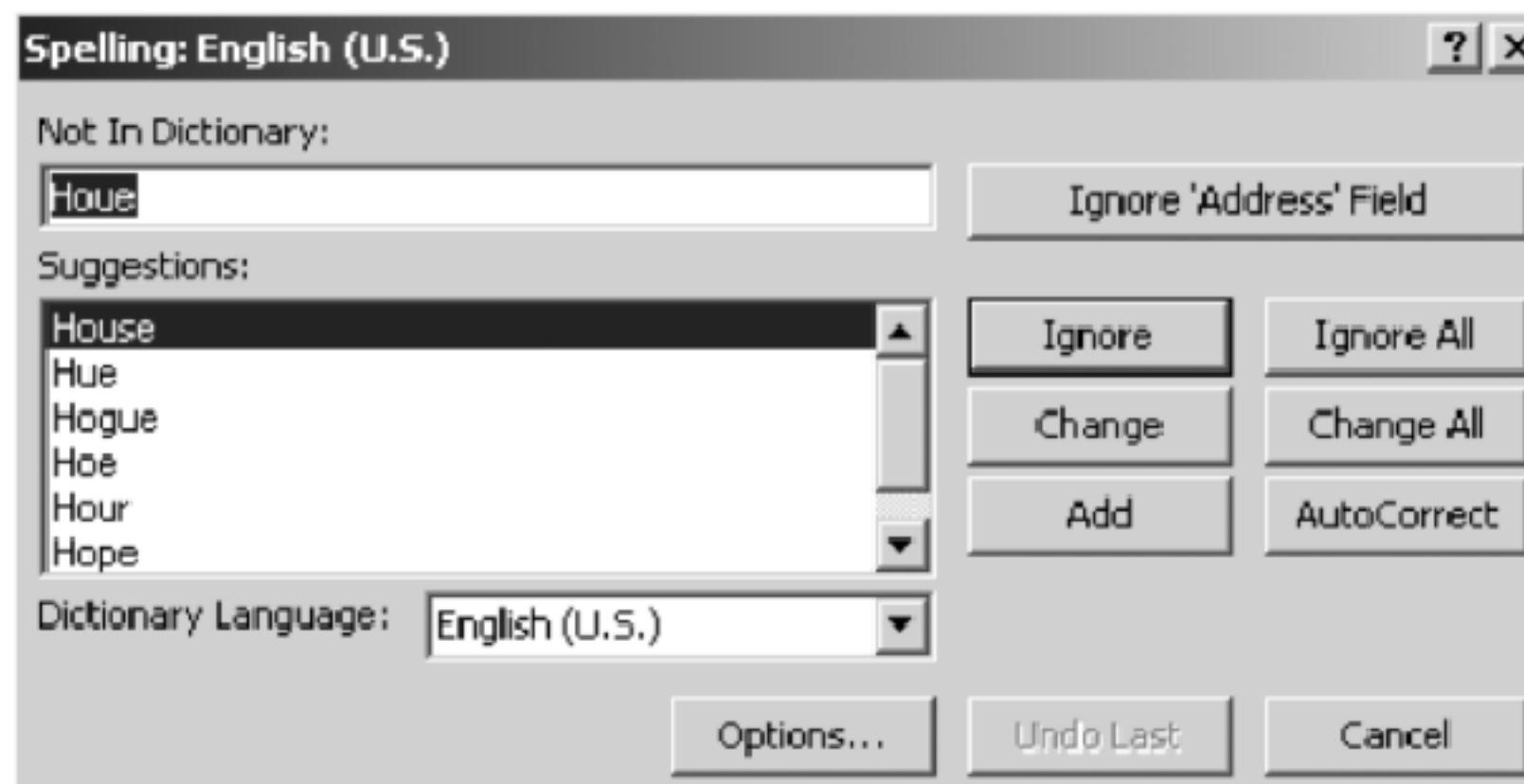
1. To replace a data item select the **replace** tab.
2. Now again repeat the same procedure of **find** but in addition to that also write the text in **replace with** text box.
3. We have two additional options of **replace** and **replace all**.
4. **Replace** will perform the single replacement and **replace all** will perform the change on all occurrences.

Q14. What are the spelling and Auto correct and print options in MS-Access? How these options are implemented?

Ans.

Check Spelling and AutoCorrect

- o This utility is used to locate the errors in spelling and grammar.
- o Autocorrect feature automatically correct common spelling errors.
- o This utility is available in tools menu.
- o Short cut key is F7.



Print a Datasheet

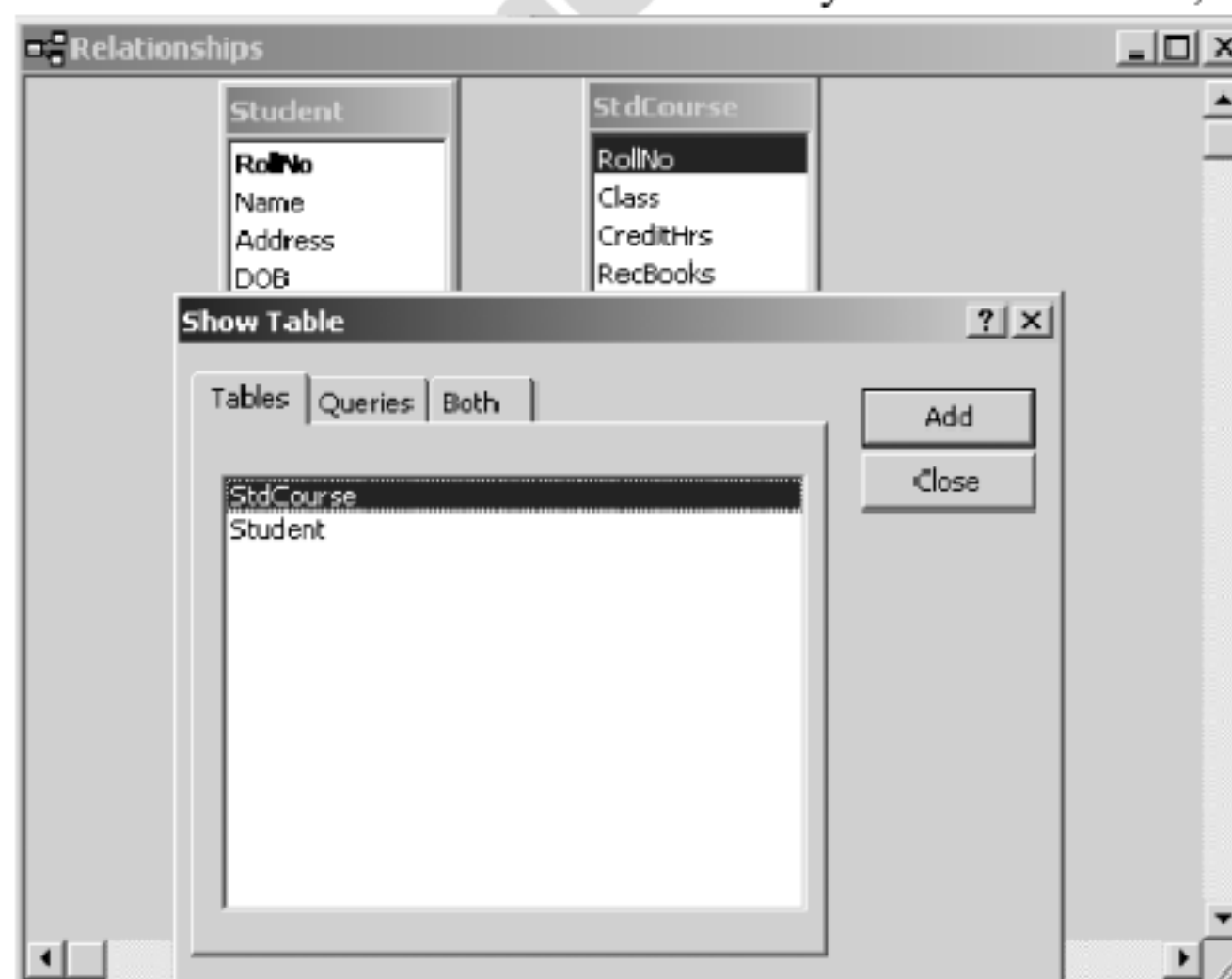
- o Datasheets can be printed by clicking the **print** buttons on the toolbar or select **print** from **file** menu to set more printing options.

Q15. How to create and edit table relationships in MS-Access?

Ans.

Table Relationships

- o The relationship between two tables can be created by linking same fields of both tables.
- o The fields that are linked in both the tables usually have same name, data type and size.

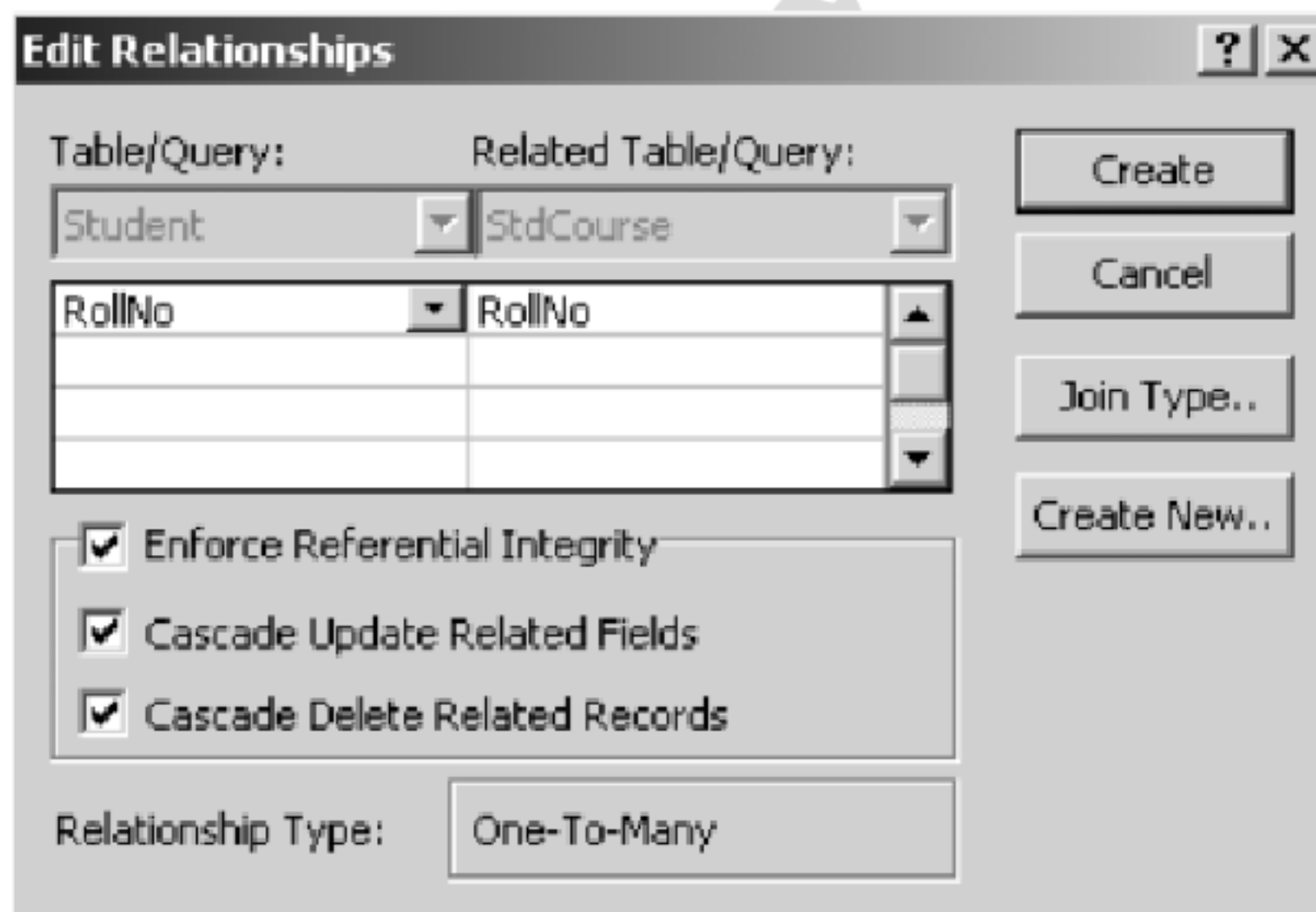


- o Fields must contain the same kind of information.
- o It is not compulsory for fields to have the same name but same names are used to avoid confusion.

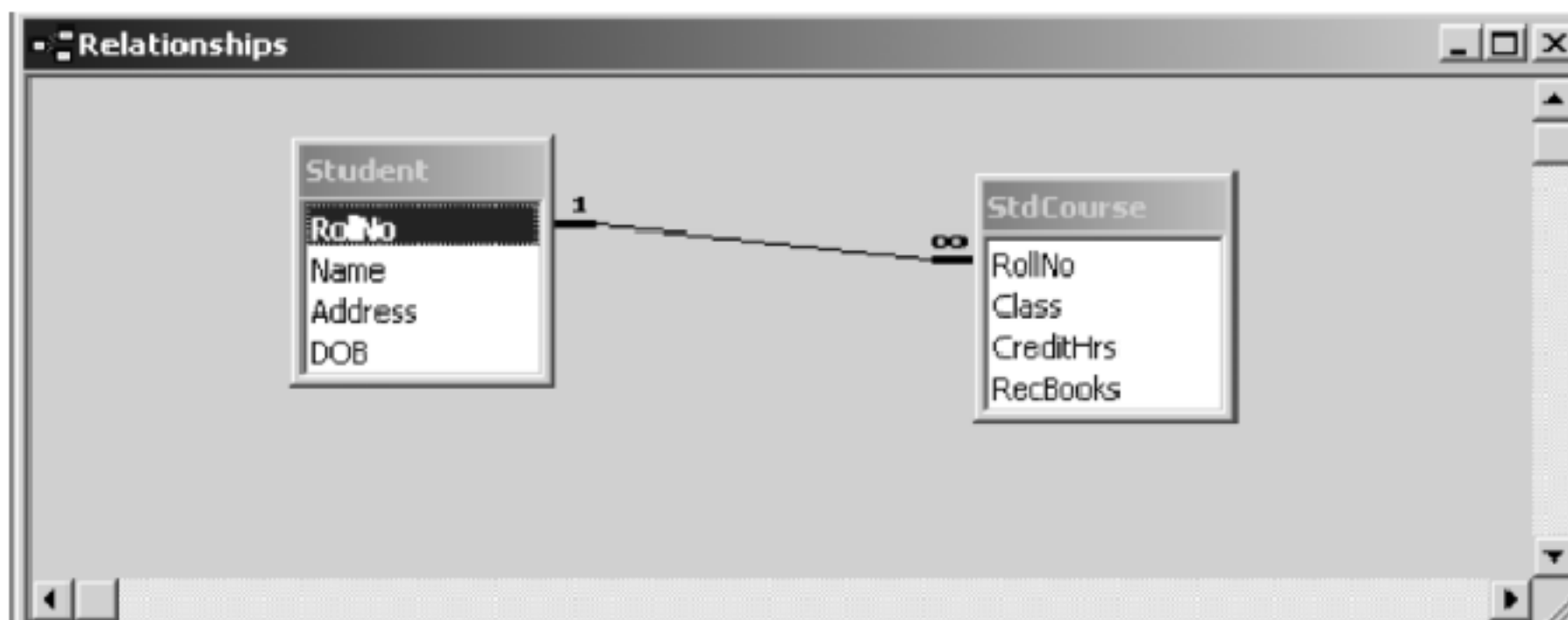
- o The table having primary key is called parent table and the table using the foreign key is called child table.

To create a relationship

1. Click the relationship icon  on the toolbar
2. The relationships window will appear
3. Select the required tables but double click.
4. Click **close** button after adding all tables.
5. Click and drag the primary key field from parent table and drop to the same field on child table.



6. A dialog will appear select the **enforce referential integrity** constraints and press **create** button
7. The relationship is created. A line joining the two related fields in the tables will appear.



The datasheet of a relational table will provide expand and collapse indicators to view sub datasheets containing matching information.

Student : Table					
	RollNo	Name	Address	DOB	
▶	1	Ali	Lahore	10/1/1991	
		Class	CreditHrs	RecBooks	
▶		CS	3	How to Program	
		ICS	4	Databases	
*					
+	2	Adnan	Karachi	2/13/1990	
+	3	Qadir	Lahore	11/21/1980	
*	0				

Record: 1 of 2

Q.16 What is a join?

Ans. The query that extracts data from two related tables in a database is called a join. The join extracts data by looking into both the related tables. It first extracts the required record from the first table and then it looks for its corresponding record in the second table. It uses the relationship between the two tables to join the records in both the tables.

Q17. What are relationship and join? Also discuss referential integrity.

Ans.

Relationships and Join

- o It provides a great advantage while handling data in related tables.
- o Before relational database there was only option of flat files.

- o Flat file is a big block of data like an excel sheet.

taleemcity.com

- o You can't analyze the data from all aspects in a flat-file.
- o With relational database design you can view data as many form as you want.
- o Joins are what makes relationships work. In most cases, you want to bring together or perform an action on data from more than one table or query

For example: You might want to view a customer's information with the orders the customer placed. To see this information, you need data from the Customers and Orders tables.

Referential Integrity

- Referential integrity is a system of rules that ensure that relationships between records in related tables are valid and that you don't accidentally delete or change related data.
- To enforce referential integrity both tables must have at least one common field, which have same data type and size.

You can set referential integrity when all of the following conditions are met:

- The matching field from the primary table is a primary key or has a unique index.
- The related fields have the same data type and **fieldsize**.

The following rules apply when you use referential integrity:

- You can't **add** a value in the foreign key field of the related table that doesn't exist in the primary key of the primary table. However, you can enter a Null value in the foreign key, specifying that the records are unrelated.
- You can't **delete** a record from a primary table if matching records exist in a related table.

For example: You can't delete an employee record from the Employees table if there are orders assigned to the employee in the Orders table.

- You can't **change** a primary key value in the primary table, if that record has related records.

For example: You can't change an employee's ID in the Employees table if there are orders assigned to that employee in the Orders table.

Cascade Update Related Fields and Cascade Delete Related Fields

If the cascade update related fields and cascade delete related records check boxes are checked in the edit relationship dialog box, whenever you update or delete a record in primary table the effect will appear in the related table automatically.

Q18. What is sorting and filtering? Also discuss different options available in them.

Ans.

Sorting and Filtering

Sorting and filtering allows viewing records of a table in different than ordinary way.

Sorting

Arranging data in alphabetical order is called sorting. It can be either ascending or descending.

1. To sort records in a table open it in datasheet view.
2. Click on the field which you want to sort.
3. Choose **Sort** command from **Records** menu and then select **sort ascending** or **sort descending**. Or
4. From the tool bar select  ascending button or  descending button.

To remove a sort

1. Open the table in datasheet view
2. Select remove filter/sort option from the records menu.
3. The data in the table will be displayed in the default order.

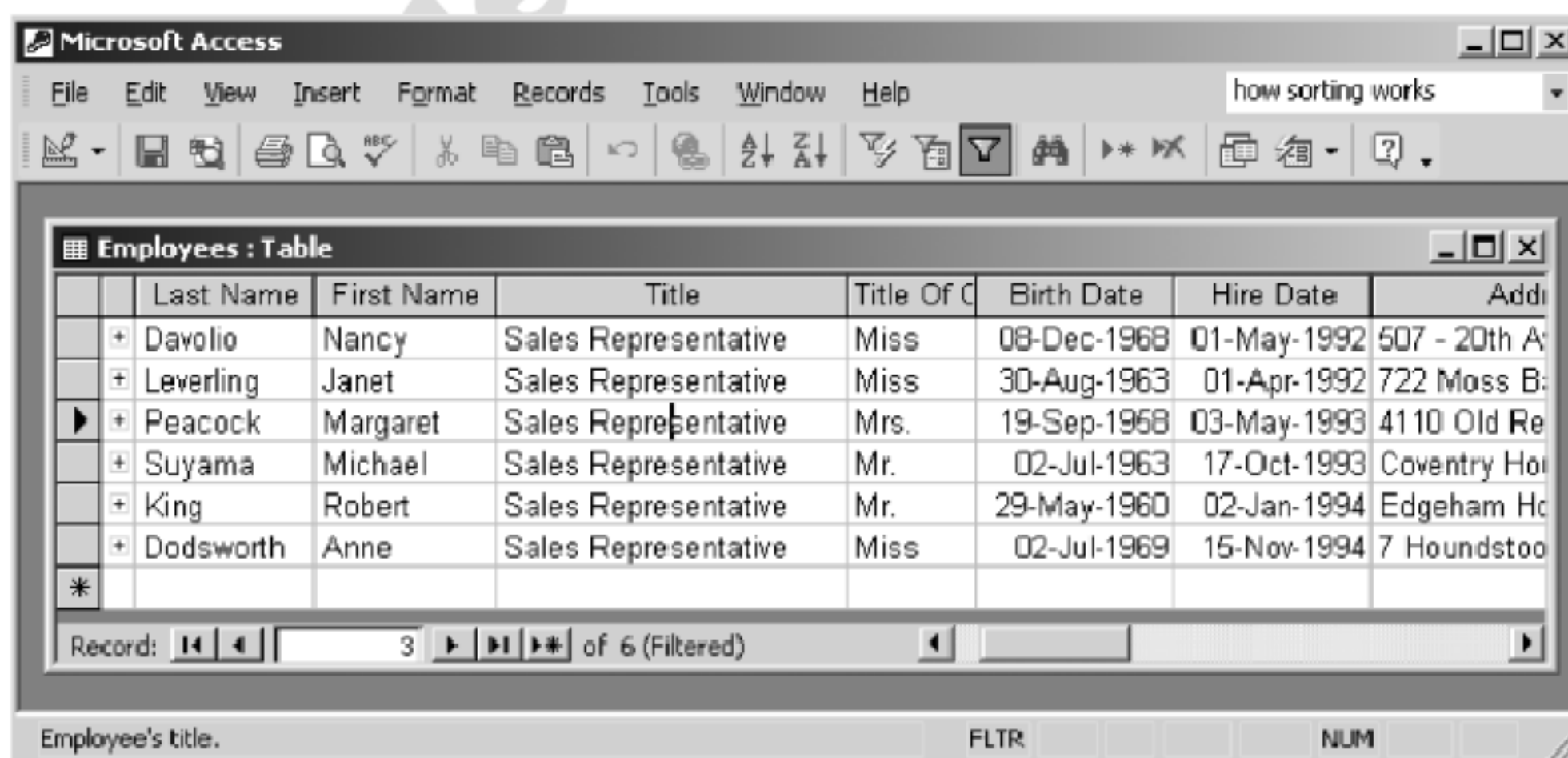
Filtering

A filter is used to extract the records that match a set of criteria. Filters are basically queries but they only appear to open tables or forms.

Filter by Selection

This feature is used to filter records that contain same data values in given field e.g. it can filter all records that have a value “Sales Representative” in title field.

1. Place the cursor in the field according to which the filter is to be applied.
2. Click **Filter by Selection** button on toolbar or select **Records** → **Filter** → **Filter by Selection** from the menu bar.



Filter by Form

This feature is useful if the table is large and it is difficult for the user to find the record that contains the value according to which the filter is to be applied. This table creates a blank version of the table with drop down menus.

1. Click on the field to enter the filter criteria under default **look for** tab of **filter by form** window.
2. Click **Or** tab at the bottom of window to specify another criteria.
3. Click **apply filter**  button on toolbar after selecting all criteria to filter.

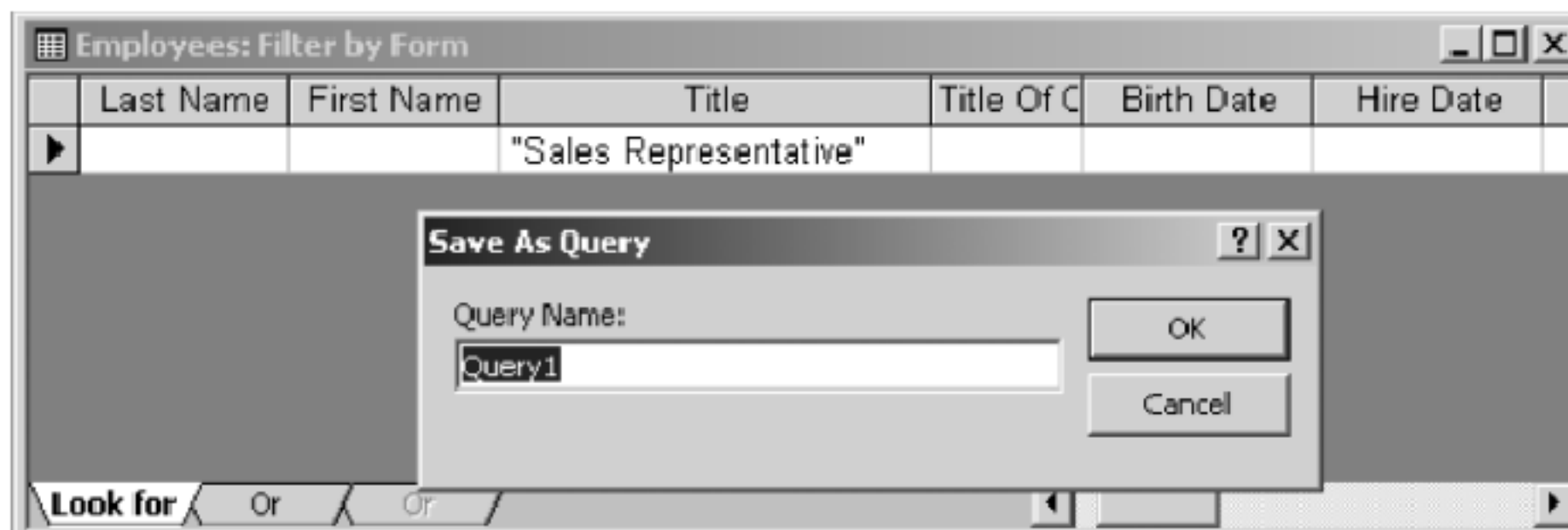


The following methods can be used where the drop down menu appears instead of selecting an absolute value.

Filter by form	
Format	Explanation
Like “*Lahore”	Selects all records that end with “Lahore”
<=”F”	Selects all records that begin with the letters A through F
>4/5/99	Selects all dates sine 4/5/99
<>50	Selects all records not equal to 50

Saving a Filter

1. Select file → save as query from the menu bar
2. Enter a name for the query
3. Click ok. The query is now saved with in the database.



Removing a Filter

1. Click the depressed Remove Filter toggle button on the toolbar



Q19. What is a Query? Also discuss its uses and advantages

Ans.

Introduction to Queries

- o A query is a question that requires some data from the database.
- o A query is created by specifying fields to display from a table or another query.
- o It can also specify condition for extracting data.
- o Queries select records from one or more tables in a database.
- o These extracted records can be used for analysis.
- o The resulting collection of records called a dynaset (short for dynamic subset).
- o The query is updated whenever the tables are updated.

Uses of Query

1. Extract records according to the specified criteria
2. Choose the fields to display in the result
3. Sort the records in a specific order
4. Calculate fields and summarize data.

A query can be given a name and it can be saved. It can also be used repeatedly. It can be used as a source of records for forms and reports.

Advantages of Query**Joining**

Query can be executed against multiple tables. In the case of related tables query join them and extract the data as a single dataset.

Flexibility

Query is a flexible way of manipulating data in a database. It provides facilities to add, remove, modify and search data.

Easy to Use

Queries are easy to use. Any one can execute query just by double clicking it.

Q20. What are the different types of queries available in MS-Access?

Ans.

Types of queries

There are five types of queries described as follows.

Select Queries

- o A select query is the most common type of query.
- o It retrieves data from one or more tables and displays the results in a datasheet where you can update the records (with some restrictions).
- o You can also use a select query to group records and calculate sums, counts, averages, and other types of totals.

Action Queries

- o An action query is a query that makes changes to or moves many records in just one operation.
- o There are four types of action queries:

1. Delete Queries:

- o A delete query deletes a group of records from one or more tables.
- o With delete queries, you 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.

2. Update Queries:

- o An update query makes global changes to a group of records in one or more tables.
- o With an update query, you can change data in existing tables.

For example: You can raise prices by 10 percent for all dairy products, or you can raise salaries by 5 percent for the people within a certain job category.

3. Append Queries:

- o An append query adds a group of records from one or more tables to the end of one or more tables.
- o To avoid typing all this information into your own database, you'd like to append it to your Customers table.

For example: Suppose that you acquire some new customers and a database containing a table of information on those customers.

4. Make-Table Queries:

- o A make-table query creates a new table from all or part of the data in one or more tables.
- o Make-table queries are helpful for creating a table to export to other Microsoft Access databases or a history table that contains old records.

Crosstab Queries

- o Crosstab queries are used to calculate and restructure data for easier analysis of data.
- o These queries calculate a sum, average, count, or other type of total for data that is grouped by two types of information — one down the left side of the datasheet and another across the top.

Parameter Queries

- o A parameter query is a query that when run displays its own dialog box prompting you for information, such as criteria.
- o For retrieving records or a value you want to insert in a field.
- o You can design the query to prompt you for more than one piece of information;

For example: You can design it to prompt you for two dates. Access can then retrieve all records that fall between those two dates.

Q21. How to create a Query using Design view?

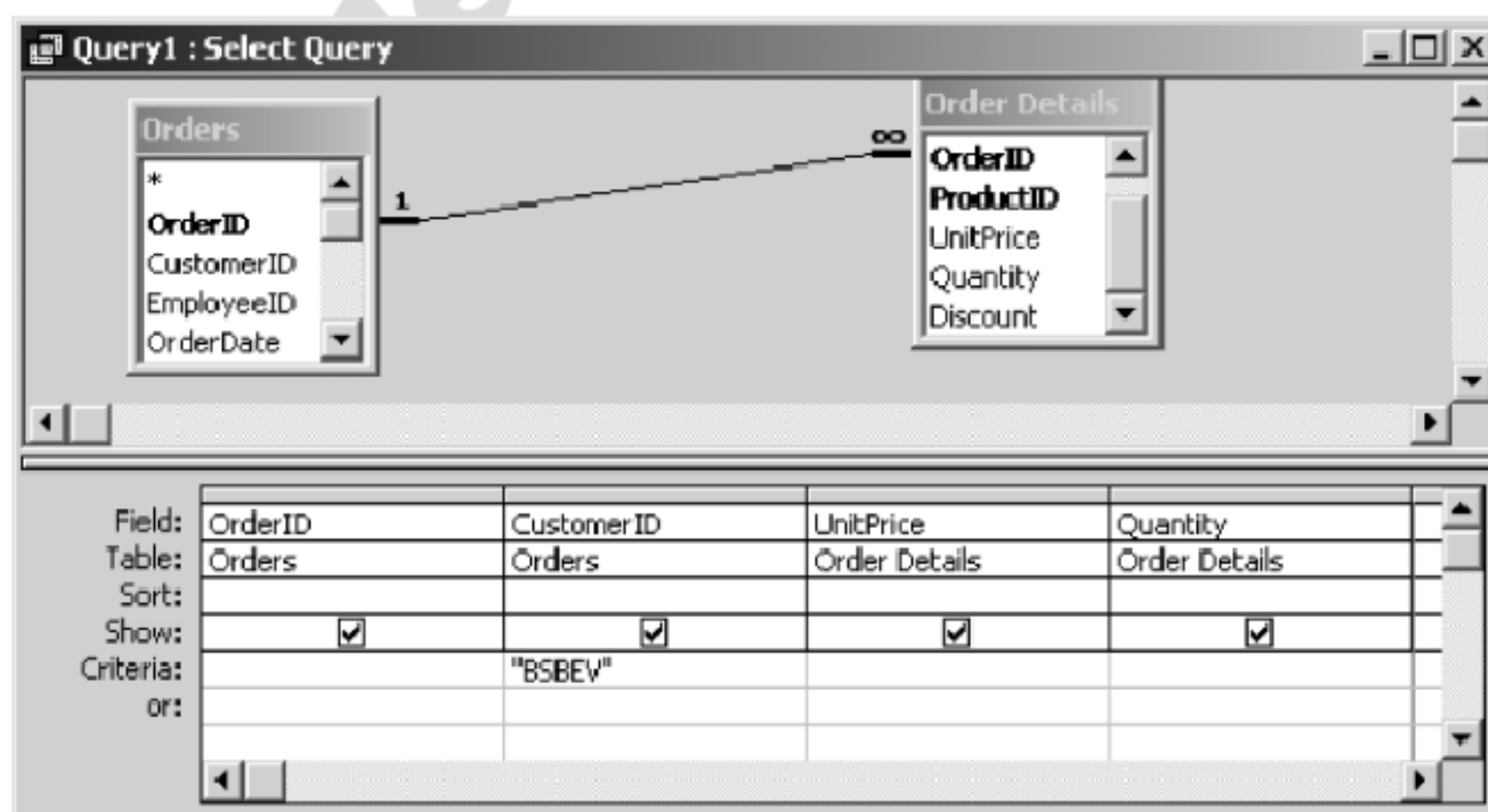
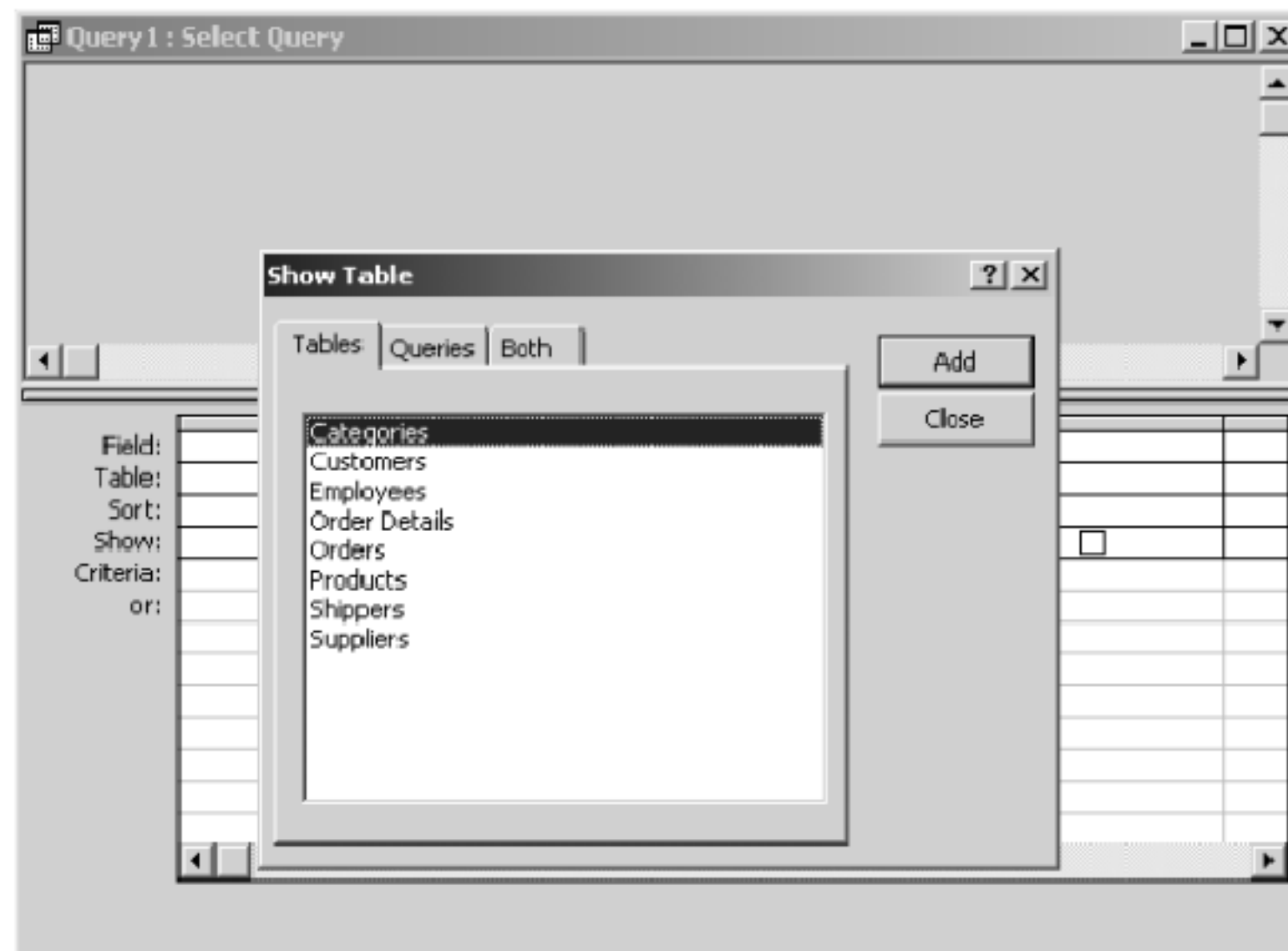
Ans.

Create a Query in design View

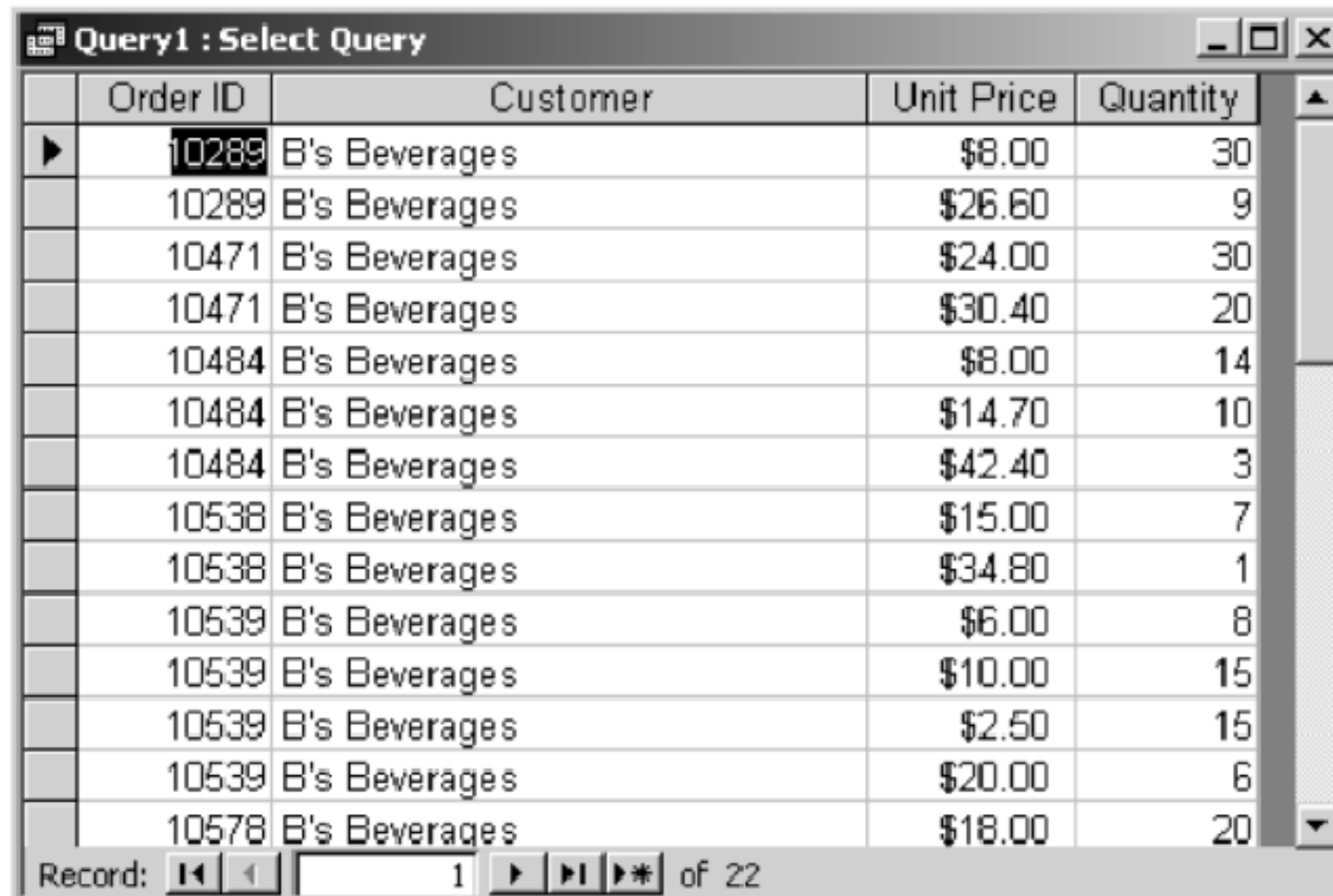
Following are the steps to create a query in design view.

1. From the database window select **queries** object.
2. Now select **create query in design view** option from right side pane.
3. A **show table** dialog box will appear with the name of tables.
4. Select the required tables by pressing **Add** button or just by **double click**.

5. Add fields from the tables to the query grid by double clicking.
6. Enter the criteria for the query in the **criteria** field.
7. Wildcards and expression builder can also be used to specify the **criteria**.



8. After you have selected all the fields and specified the criteria click the  run button on the toolbar.



Order ID	Customer	Unit Price	Quantity
10289	B's Beverages	\$8.00	30
10289	B's Beverages	\$26.60	9
10471	B's Beverages	\$24.00	30
10471	B's Beverages	\$30.40	20
10484	B's Beverages	\$8.00	14
10484	B's Beverages	\$14.70	10
10484	B's Beverages	\$42.40	3
10538	B's Beverages	\$15.00	7
10538	B's Beverages	\$34.80	1
10539	B's Beverages	\$6.00	8
10539	B's Beverages	\$10.00	15
10539	B's Beverages	\$2.50	15
10539	B's Beverages	\$20.00	6
10578	B's Beverages	\$18.00	20

9. You will see the result of query in a grid like table.
10. Save the query by clicking the save button.

Specifying Criteria

- Criteria are limits you place on a query to identify the specific records you want to work with.

For example: Instead of viewing all the suppliers that your company uses, you can view just suppliers from Japan. To do this, you specify criteria that limits the results to records whose Country field is "Japan".

To specify criteria for a field in the design grid, enter an expression in the Criteria cell for that field. The expression in the preceding example would be "Japan". You can use more complicated expressions, however, such as "Between 1000 And 5000".

Wild Cards

Wildcard characters are used as placeholders for other characters when you are specifying a value you want to find and you:

- Know only part of the value.

- Want to find values that start with a specific letter or match a certain pattern.

Wildcard characters are meant to be used with fields that have the Text data type. You can sometimes use them successfully with other data types, such as dates.

A list of wildcard characters is given below.

Query Wildcards and Expression Operators	
Wildcard/Operator	Explanation
?	Matches any single alphabetic character e.g. B?ll finds ball, bell, and bill
*	Matches any number of characters. It can be used as the first or last character in the character string e.g. wh* finds what, white, and why
<1	Value less than 1
>=0	Value greater than or equal to 0
<>"X"	Not equal to (all classes besides X)
Between 1 and 100	Numbers between 1 and 100
Is Null	Find records with no value
Is Not Null	Find all records that have a value
Like "a*"	All words beginning with "a"
>0 and <=10	All numbers greater than 0 and less than 10
"Ali" or "Salman"	Values are Ali or Salman

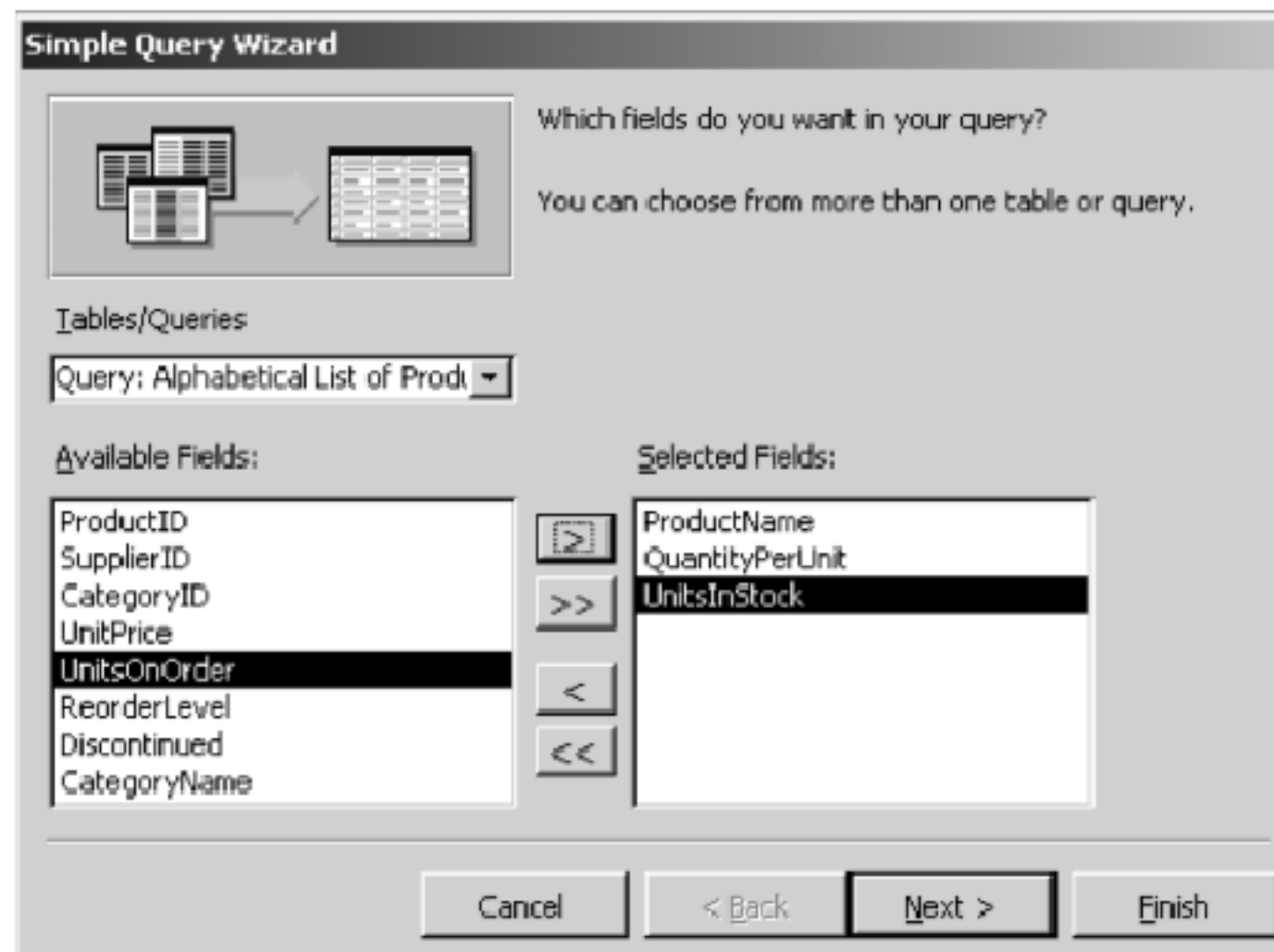
Q22. How to create a Query using Query wizard?

Ans.

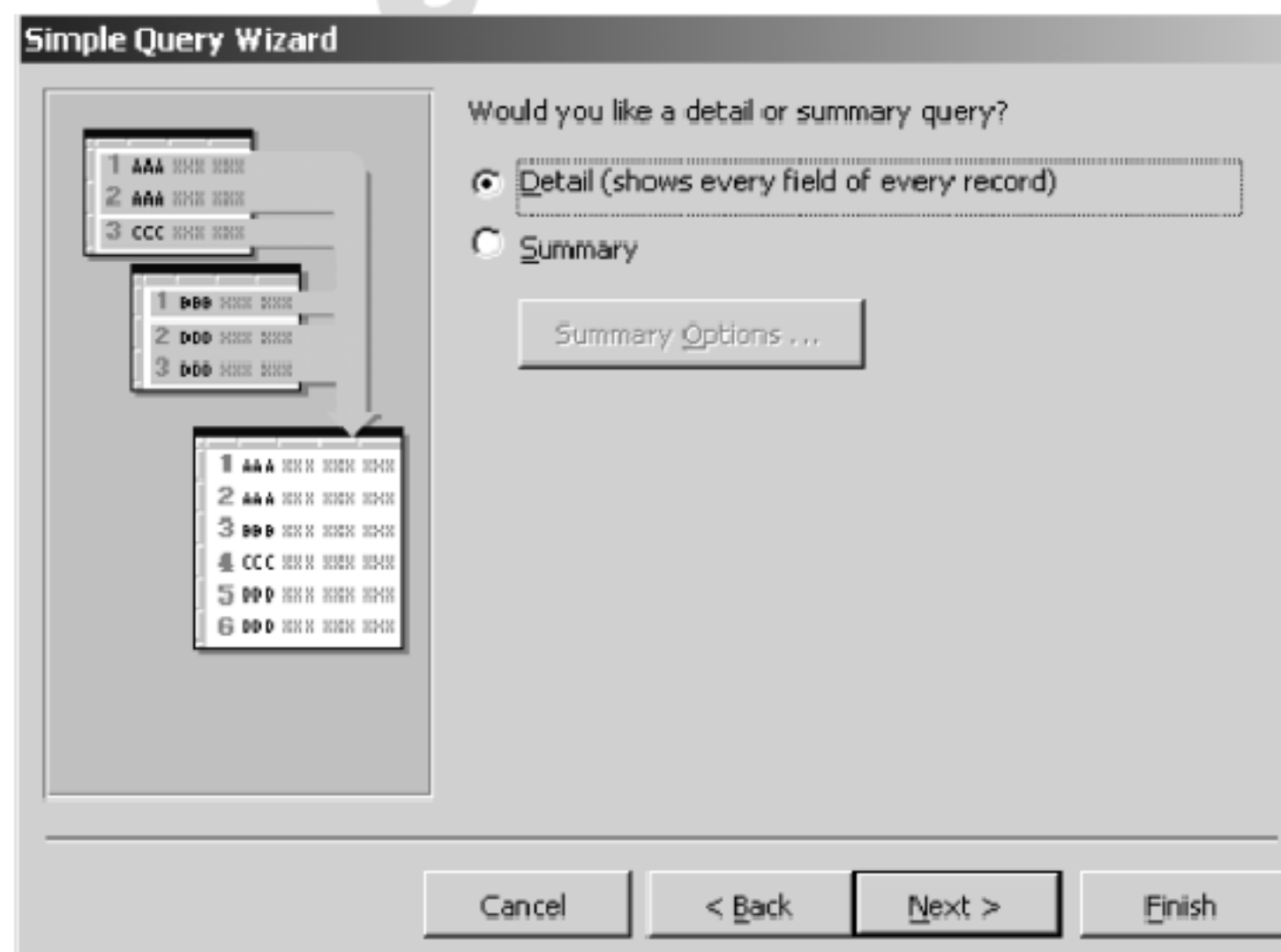
Query Wizard

MS-Access query wizard will easily assist you to begin creating a select query.

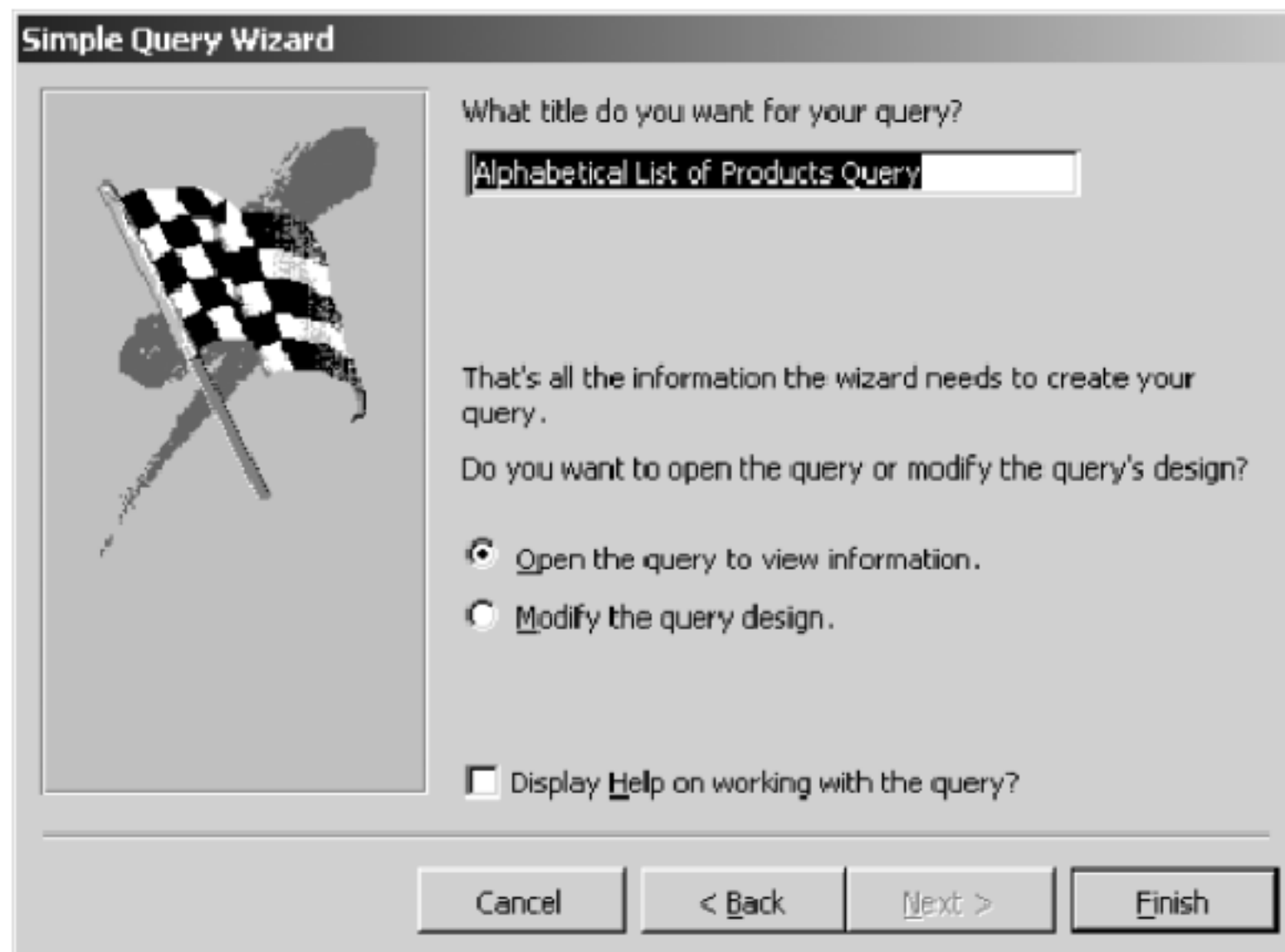
1. Click the create query by using wizard icon in database window.
2. Select the fields you want to be included.



3. Click next button.



4. From this screen select the detail view or summary view. Detail view will show every field of every record and summary view will give the summarized data.
5. Press next button.

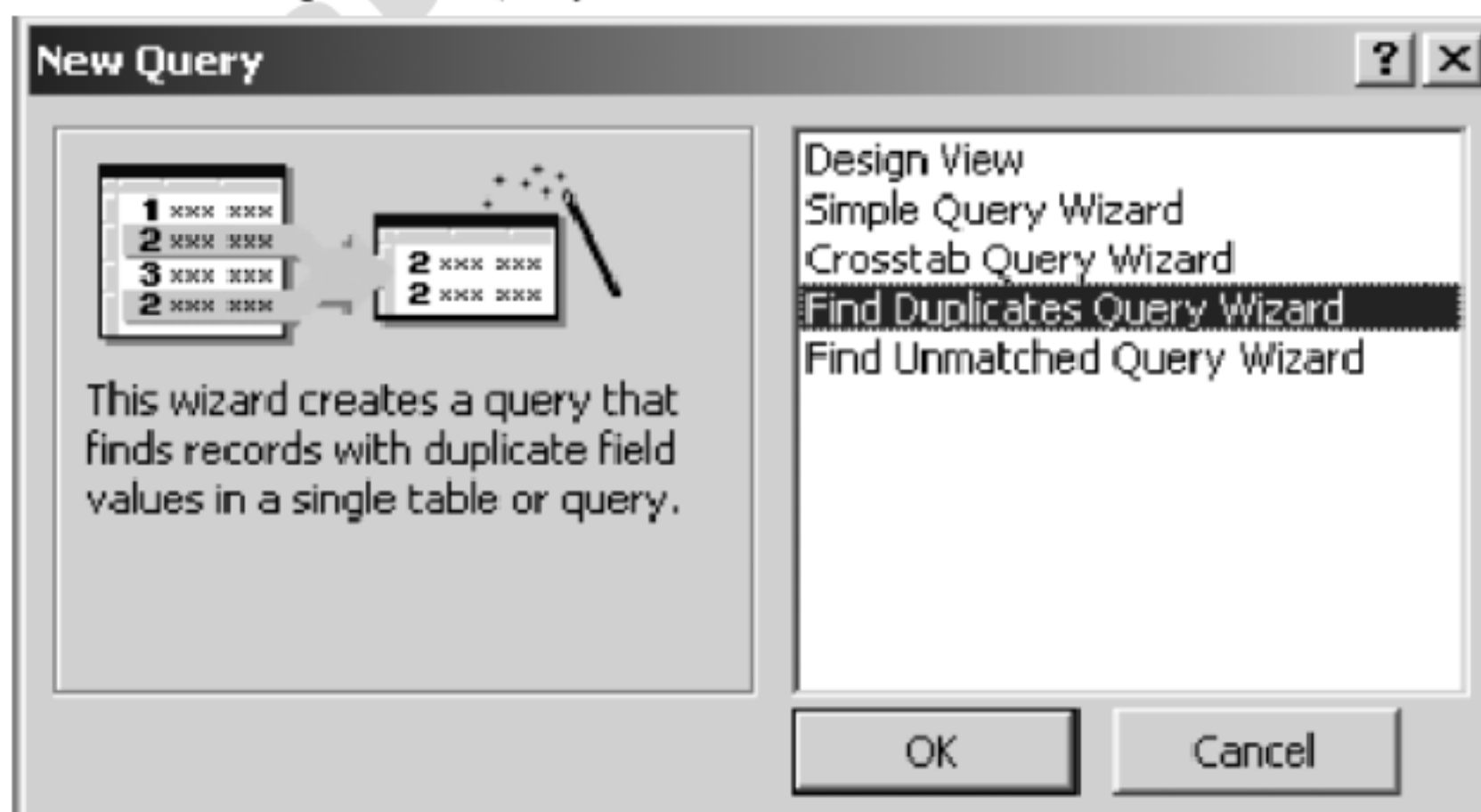


6. On the next window enter the name of the query and click finish.

Find Duplicates Query

This query will filter out the records in a single table that contain duplicate values.

1. Click on new button on the queries database window.
2. Select Find Duplicates Query Wizard



3. Select the table or query that you want to use in this query.

Find Duplicates Query Wizard

Which table or query do you want to search for duplicate field values?

For example, to find cities with more than one customer you would choose a Customer table below.

Table: Categories
Table: Customers
Table: Employees
Table: Order Details
Table: Orders
Table: Products
Table: Shippers
Table: Suppliers

View
☒ Tables ☐ Queries ☐ Both

Cancel < Back Next > Finish

4. Select the fields that may contain duplicate values using arrow buttons.

Find Duplicates Query Wizard

Which fields might contain duplicate information?

For example, if you are looking for cities with more than one customer, you would choose City and Region fields here.

Available fields:

CustomerID
ContactName
ContactTitle
PostalCode
Country
Phone
Fax

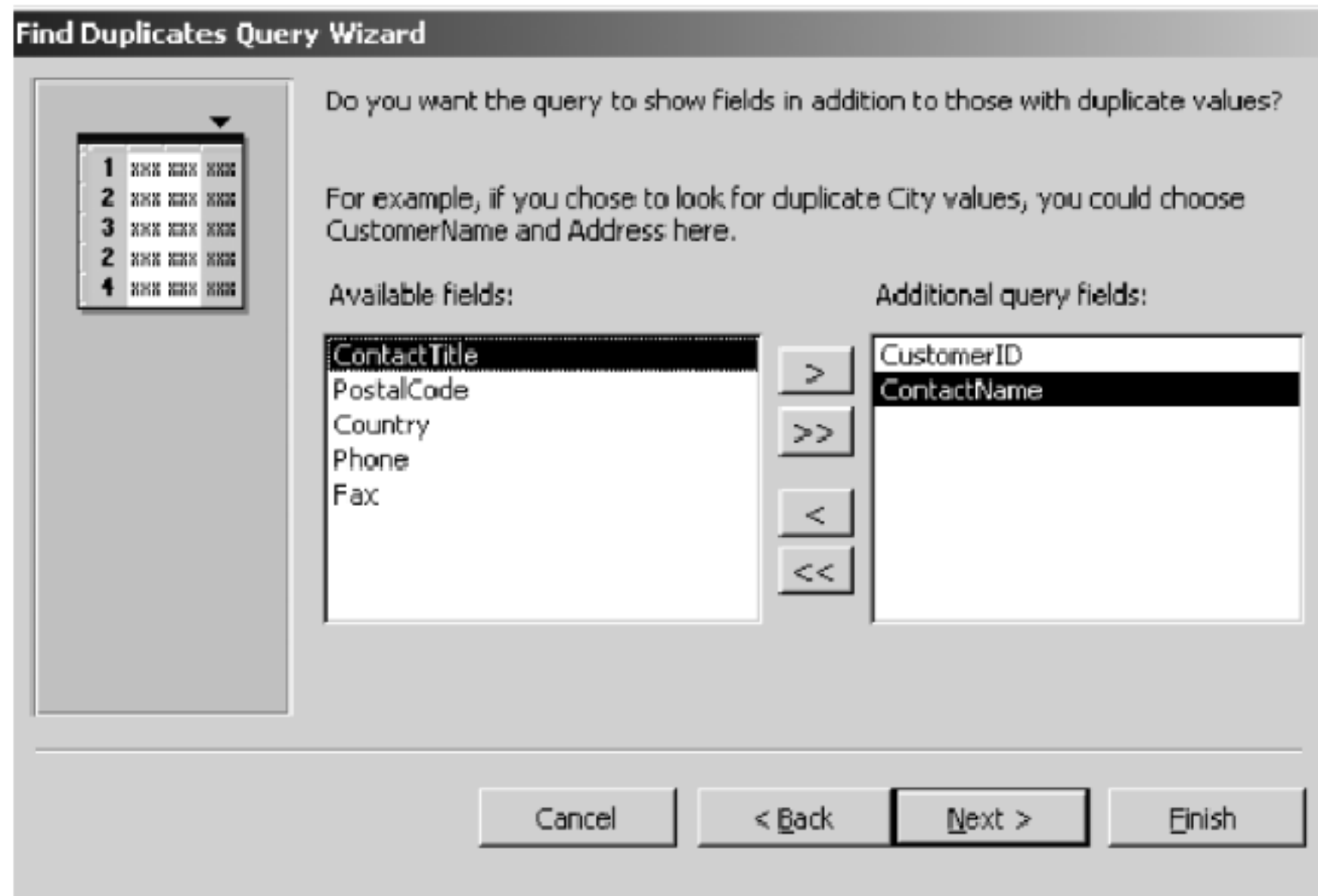
Duplicate-value fields:

CompanyName
Address
City
Region

> >> < <<

Cancel < Back Next > Finish

5. Press the next button.



Find Duplicates Query Wizard

Do you want the query to show fields in addition to those with duplicate values?

For example, if you chose to look for duplicate City values, you could choose CustomerName and Address here.

Available fields:

ContactTitle
PostalCode
Country
Phone
Fax

Additional query fields:

CustomerID
ContactName

Buttons: Cancel, < Back, Next >, Finish

6. Now select the field which you want to display along with the selected fields.



Find Duplicates Query Wizard

What do you want to name your query?

Find duplicates for Customers

Do you want to view the query results, or modify the query design?

☒ View the results.

☐ Modify the design.

☐ Display Help on working with the query.

Buttons: Cancel, < Back, Next >, Finish

7. Name the new query and click Finish.

Delete a table from the query

Click the table's title bar and press **delete** key on the keyboard

Sorting Query Field

By default data extracted by queries are not sorted. However we can sort any field explicitly in ascending or descending order.

1. Click on the sort row in the field column you want to sort.
2. Click on the down arrow, a menu will appear
3. Click on ascending or descending to sort accordingly.

Performing Calculations in a Query

A query can be used to perform a calculation on a group of records. The user can perform calculation in a query by using predefined calculation in MS-Access. The user can also create a custom calculation according to the requirement.

MS-Access provides following calculation types.

Group by:	identified the group to calculate.
Sum:	Add the values.
Avg:	Average of the values.
Min:	Finds the minimum value.
Max:	Finds the maximum value.
Count:	Counts the number of values.
StDev:	Calculates the Standard Deviation.
Var:	Calculate the Variance.
First:	Finds the first field value.
Last:	Finds the last field value.
Expression:	Creates a calculate field through an expression.
Where:	Indicates criteria for a field not included in the query.