

**King Fahd University of Petroleum and Minerals**  
**MIS-105--- Introduction to Computer Applications**  
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**MIS105 Lab#7: Introduction To Microsoft Access**

Microsoft Access is a Database Management System program, used to create and manage a database for any real life environment.

**Similarities with Microsoft Excel**

Microsoft Access:

1. is capable of saving data records in form of database tables.
2. allows the use of filtering, sorting and charting for data analysis.
3. allows the use of advanced analysis techniques like pivot table, pivot charts etc.

**Differences with Microsoft Excel**

Microsoft Access:

1. allows Accurate data entry by implementing automated data validity checks.
2. provides the facility to save data in multiple tables related with each other.
3. provides better data reporting facilities.
4. provides easy to handle data entry procedures through database forms.
5. provides easy & interactive web integration.
6. provides facility to automate the working of different database objects with programmable user interface components like buttons, lists etc.

**Components of Microsoft Access**

**Database File**

- Microsoft Access uses a single disk file for saving all components of the relevant database.
- The disk file for Microsoft Access can be identified by the extension **.mdb**
- The components saved inside an MDB file are:
  - Different database objects like tables, queries, forms etc.
  - Database data dictionary tables, used internally by Microsoft Access for certain DBMS tasks.

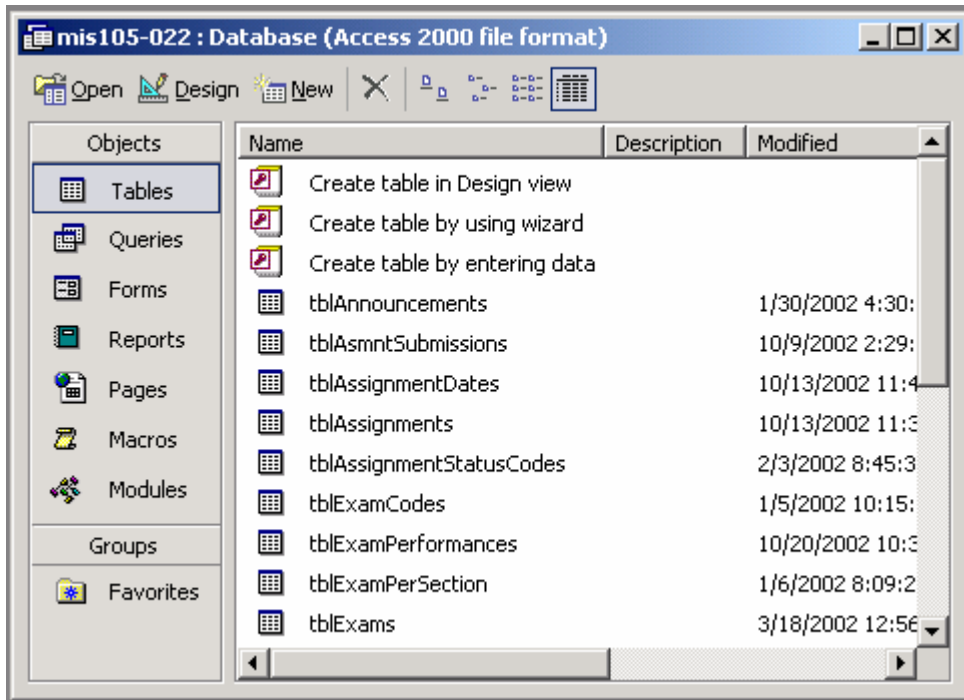
**Hands On 7.1:**

1. Locate the database files provided to you as a web link on your floppy.
2. Note down the file names and their extensions.

**Database Window**

- Starting window appears when a database file is opened with Microsoft Access.

- The window provides an access point for all existing objects in the database file like tables, forms, queries etc.
- Categorize the objects with differently labeled tabs.



**The Database Window – Microsoft Access**

### Hands On 7.2:

1. Open the database file, named Bookstore.mdb.
2. Identify different objects provided to you in the database by clicking on different tabs of database window.
3. Identify the table names, queries, forms and reports provided.

### Table Object

1. A table object stores actual data records about a physical entity such as a person, place, or thing.
2. A table is the most basic element in a database. No other object like form, query etc. can work if there is no data in the tables.
3. A table is similar to a Excel worksheet in appearance, with each record appearing in a separate row.

### Hands On 7.3:

1. Click the Tables tab.
2. Double click on the table given there, named Books.

## Table Views

Table object in Microsoft Access can be viewed at in 4 different ways, provided in View menu (when the table is opened).

1. Design View- allows to make changes in the table record structure. e.g. if more columns are needed in the table like **AvailableCopies** in the Book Table.
2. Datasheet view – allows to see and manage (add/ delete/ modify) the data inside the table.
3. Pivot Table view – allows to see the table data in form of a summarized report.
4. Pivot Chart view – allows to see the table data in graphical summary format.

### Hands On 7.4:

1. Make sure you are in ‘Datasheet View’ while looking at Books table.
2. By looking at the bottom of the table window, determine
  - a. the total number of records in the table
  - b. the current record position.
3. Navigate among the table records by making use of
  - a. Arrow keys
  - b. TAB key
  - c. Navigation control (at the bottom of the window)
4. **Add a new record** by following the procedure on page 11 of your lab book.

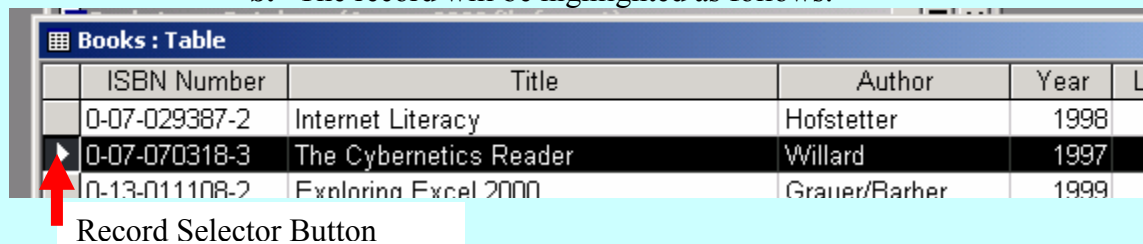
**Note:** There is no need to save a record by pressing save button, after it is entered. Microsoft Access automatically saves the record after all fields are entered and the user changes the current record position to the next record.

5. **Modify an existing record** by following the procedure on page 12 of your lab book.

**Note:** There is no need to save a record by pressing save button, after it is modified. Microsoft Access automatically saves the changes when the user changes the current record position to the next record.

#### 6. Selecting a record

- a. Use you mouse to click the record **selector button** of the desired record.
- b. The record will be highlighted as follows.



	ISBN Number	Title	Author	Year	L
	0-07-029387-2	Internet Literacy	Hofstetter	1998	
	0-07-070318-3	The Cybernetics Reader	Willard	1997	
	0-13-011108-2	Exploring Excel 2000	Grauer/Barber	1999	

Record Selector Button

## 7. Deleting a record

a. After selecting a record, press **Del key** (or **Delete Record button**).

b. In the confirmation box, press Yes to confirm the delete.

**Note:** Once a record is deleted, the deletion can not be **Undo**. So be careful while confirming your deletion requests.

## Form Object

- A form object is for the purpose of manipulating data in a table. In other words, the activities of adding, deleting and modifying records can also be done with a Form as it is done with a Table.
- However, a Form provides a friendlier interface than does a Table.
- With a Form, data manipulation job is becoming very easy and interesting.
- A Form provides some controls similar to the Table data sheet view interface, including the 'navigation control' and the 'record selector'.
- In addition a Form also provides additional controls (command buttons, list boxes, check boxes, radio buttons etc.) for the purpose of having a friendlier interface.

## Hands On 7.5:

- **Working with a Form**

- a) Select the Forms tab of database window and open the form, named 'Books'.
- b) Use Form's command button controls to add a new record (see Figure 1.4 on page 15)
- c) Check the data validation capability by entering a text value in Price.

## Query Object

- A query acts like a filter as it works with only a selected number of records in a table.
- A query can be used to:
  - Show selected records and fields,
  - add new records,
  - delete selected records,
  - update selected records etc.

### Hands On 7.6:

- **Working with a Query**
  - a) Select the Query tab of database window and open the form, named 'Publication Year'.
  - b) In the dialogue box, enter **1998**.
  - c) The result will list all the book names which are published in the year 1998.

### Report Object

A report is for the purpose of displaying the query results in a more presentable form.

Reports cannot be used to modify data in the table.

### Hands On 7.7:

- **Working with a Report**
  - a) Select the Report tab of database window and open the report, named 'Publication Year'. Enter the value 1998.
  - b) The report content will be displayed.

### Page Object

- Used to publish Microsoft Access data on the web.

### Macro Object

- Used to connect different database objects with different controls like command button, etc.

### Module Object

- Same purpose as macros but more powerful in functionality by making use of Visual Basic code.




### Use of Filter and Sort with Table Object

- A table object's 'datasheet view' can be utilized to look at data records more effectively by making use of:
  - a) **Filtering**: for blocking the unwanted records.
  - b) **Sorting**: for arranging the displayed record in a proper ordering.


### Types of Filters

1. **Filter By Selection** – The records having the selected value of the currently positioned field will be searched and displayed.
2. **Filter Excluding Selection** – The records having the selected value of the currently positioned field will be excluded from the display.
3. **Filter By Form** – More flexible and powerful in specifying the record selection criteria. The advantages can be looked at page 19.

### Hands On 7.8: Working with Filters

1. Open the database file, named **Employees**.
2. Let say you want to see details about all 'Account Rep'.
3. Position your cursor to any record of Account Rep and press '**Filter By Selection**' button.  Filter By Selection
4. You should see only 9 records with a label, named '(Filtered)' appearing in the status bar.
5. To remove the filtering, press '**Remove Filter**' button.  Remove Filter
6. For '**Filter Excluding Selection**', repeat the above procedure but use the option *Record menu | Filter | Filter Excluding Selection*.
7. For '**Filter By Form**', more complex criteria can be entered:
  - a. Press Filter by form button.  Filter By Form
  - b. In the resulting row, enter the criteria under the field(s). For example, let say we want to see those employees whose *location* is in Chicago and whose *salary* is more than \$30,000.

EmployeeID	LastName	FirstName	Location	Title	Salary	Gender	Performance
			'Chicago'		>3000		



8. Press 'Apply Filter' button.  Apply Filter
9. The result of the filtering will be shown.
10. Additional criteria can be provided by using the 'or' tab.

### Types of Sorting

1. **Ascending Order** – Smallest value will appear first then the next higher and so on.
2. **Descending Order** – Biggest value will appear first then the next smaller and so on.

**Note:** Sorting cannot be done on more than one field at a time. However, a second field can be specified in case if a value of the sort-field is repeated in more than one record.

### Hands On 7.9: Working with Sorting

1. Open the database file, named **Employees**.
2. Let say you want to arrange the records on the basis of 'Last Name'.
3. If you want the arrangement in ascending order of Last Name, press  otherwise 
4. Try to repeat the same procedure with 'Salary'.
5. **Sort on two fields:** When sorting is done with Location, there will be no sorting found in similar location records.
6. The above problem can be controlled by doing sorting on two fields at a time. **The fields must be adjacent to each other.**
7. Bring Location column before Last Name column. Select both columns and then press 'Sort Ascending' button.

## Pivot Tables & Pivot Charts

- Pivot tables & chart are for the purpose of a better data analysis which is actually, a function of Microsoft Excel. Microsoft Access helps the users in this area to some extent.
- A pivot table computes summary statistics for the records in a table (or query results) on a two dimensional basis.

### Example Pivot Table Creation:

In a data table of **Students**:

ID#	Name	Major	Course	Score
9910	X	MIS	ENG214	70
9911	Y	ICS	ENG214	60
9912	Z	MIS	ENG214	80
9910	X	MIS	MATH101	80
9911	Y	ICS	MATH101	69
9912	Z	MIS	MATH101	70
9910	X	MIS	ICS102	80
9911	Y	ICS	ICS102	50
9912	Z	MIS	ICS102	40

Lets say, you want to produce a summary report in a compact form about the **average performances** of each **department** in different **courses**. A compact table providing this statistics could be build as follows:

	COURSES		
MAJOR	ENG214	MATH101	ICS102
ICS	AvgOf ENG214 Scores for ICS Dept	AvgOf MATH101 Scores for ICS Dept	AvgOf ICS102 Scores for ICS Dept
MIS	AvgOf ENG214 Scores for MIS Dept	AvgOf MATH101 Scores for MIS Dept	AvgOf ICS102 Scores for MIS Dept

All values of **Courses** appearing in the data will be listed in columns

All values of **Majors** appearing in the data will be listed in the rows.

### A Pivot Table Example

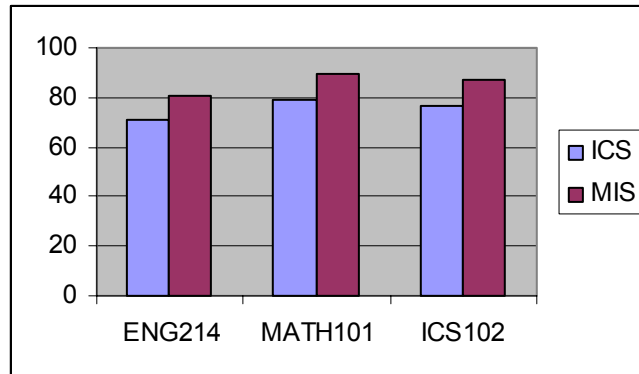
#### Pivot Table Components

A pivot table has the following main components:

1. The field (e.g. Major) values for the rows
2. The filed (e.g. Courses) values for the columns
3. The field (e.g. Scores) on which the calculation will be done.

4. What computation function (e.g. Average) will be used in calculating the results.

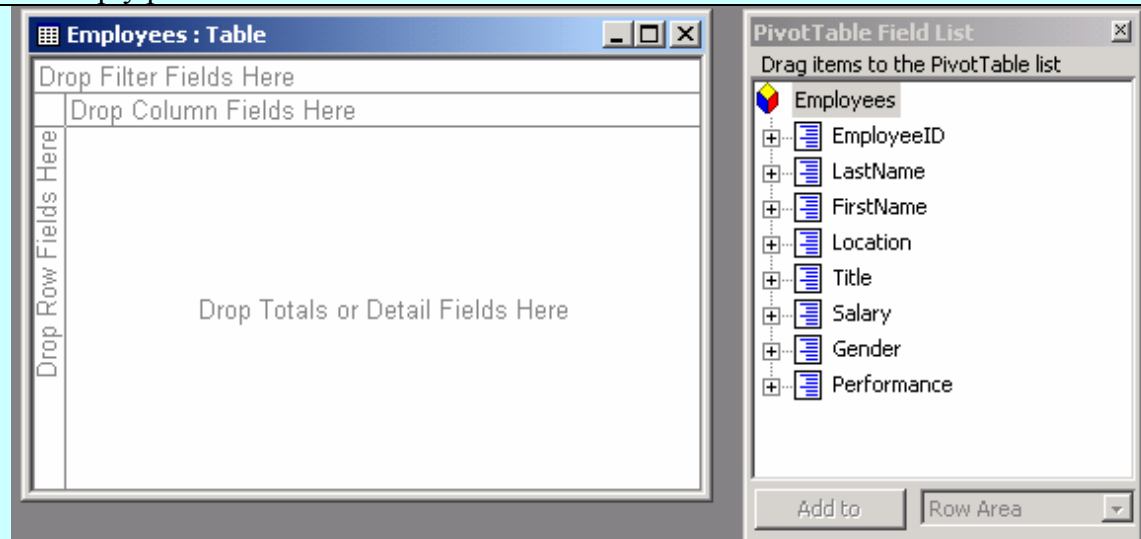
A Pivot Chart is a graphical representation of a pivot table.



**A Pivot chart**

### Hands On 7.10: Working with Pivot Table View

1. Open the database table, named **Employees**.
2. Change the view to the pivot table view. The following screen will appear showing an empty pivot table.



3. Build the pivot table which can show the **Average Salaries** on the basis of **Job Title** and **Location**.
  - a. **Row Field:** Location
  - b. **Column Field:** Job Title
  - c. **Field for computation:** Salary
  - d. **Computation Function:** Average
4. Additionally, a filter field can be added on the top. For example, Gender.