Microsoft Access





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^{*U*} ^{*n*} ^{*i*} *t* Database Introduction

Objective :

- u Explaining the Concept of Databases
- u Discussing the different Datamodels
- u Overview to the Concept of Normalization

Contents :

- 1.1 Introduction
- 1.2 Need of Database
- 1.3 A dvantages of a Database
- 1.4 Functions of a Database
- 1.5 Features of Database
- 1.6 Applications of Microsoft Access
- 1.7 Basic Steps for Database Designing
- **1.8 Database Models**
- 1.9 Relational Database.
- 1.10 Elements of Relational Database.
- 1.11 Normalization
- 1.12 Invoking MS-Access

1.1 Introduction

In today's changing technological environment, the role of data and information is immensely felt. Data and information are valued and maintained as an invaluable resourse. The data that are structured and organized for a quick access and easier management is known as a database or in simpler terms a systematic organisation of data is called a database. Example- One of the simplest forms of database (noncomputerized) is your address diary that contains addresses of your friends and relatives. It stores their names, addresses, cities, pin codes, and telephone numbers. In a non-computerized database, as the amount of data increases, creating, storing, and changing it becomes difficult. For example, in a library that does not have a computerized database, three sets of cards will have to be maintained one arranged alphabetically by the title of the of the book, second arranged by the authors name, and the third arranged by the subject name. The information in all the three sets is the same. Computerized databases allow us to have a single set of information and give us access in all the three ways. This is the reason that more and more databases are being stored and manipulated on computers. A computerized database allows easy, efficient storage, retrieval and modification of data. This has been accomplished through the inception of the database management systems. In this book, we will discuss the fundamentals of database, Database Management System (DBMS) and the practical use of a Relational Data Base Management System (RDBMS) using Microsoft Access.

'A Data base is collection of data and a Relational Database is a collection of related data.'

1.2 Need of database

Without database it is difficult to manage the record, such as home telephone diary is maintained in which important telephone numbers are stored. Let's see some advantages of a database

- 1. Database reduces duplication of data.
- 2. Database control data inconsistency to a larger extent.

- 3. Database helps us sharing of data
- 4. Database can ensure data security. Only authorized person can assess data.
- 5. Database checks validity of data
- 6. Database maintains certain standards, which must be applied to data.

1.3 Advantage of database

Database should be organized and easy to understand. It should give definite knowledge. The advantage to use databases by people for business and personal are:

- 1. Retrieving desired information
- 2. Taking meaningful decision
- 3. Reorganizing information
- 4. Processing information

1.4 Functions of database

- 1. Create tables to store data item
- 2. Edit data record
- 3. Retrieve data selectively from stored records to provide specific information
- 4. Prepare printed information retrieval reports
- 5. Perform calculation.
- 6. Create screens that can interact with user. (Eg.- In Access & FoxPro)
- 7. Reports with graphs and quality fonts.

Features of a database management system (DBMS)

The various features, which make a DBMS a powerful tool to design or create database, are listed here.

- 1. Easy to learn: Most of the database management systems are easy to learn and use. No specialized training is required to work on a DBMS.
- 2. Reduces data redundancy: Redundancy implies duplication (or repetition) of the same data in different files For example, in the traditional record keeping system, the administration department of a school maintains the contact details including the addresses of the students in a file. In addition, their addresses are stored with the result in a separate file. This leads to redundant storage of the address. The database management systems, on the other hand, maintain all the data in a single repository (centralized location).
- 3. Reduces data inconsistency: When there are two files containing the same data and one file is updated while the other file contains the old data, it leads to inconsistency records maintain by the administration department but not in the file storing the results. By storing the data in a single place, database management systems avoid data inconsistency.
- 4. Facilitates data sharing: Most of the database management systems allow sharing of data among multiple users and applications. For this, the data is created or stored in one repository and can be made available to different users according to their requirements. For example, in an airline cancellation system, a database is maintained and stored (centrally) for the reservation and the cancellation of air tickets. Data can be accessed and shared by two different reservation offices at two different places according to their requirements.
- 5. Enforces data standards: Storing data in standardized form .
- 6. **Password protected:** It allows users to provide a password to their database which provides security to data from unauthorized access.

7. Extensive help: It has a built-in-help whic can be used when a user faces some problem while using any database management application.

1.6 Applications of Microsoft Access

- 1. In schools, to keep a record of students, their addresses, results, etc.
- 2. In organization, to keep record of the employees salary, attendance, expenses etc.
- 3. In banks, to maintain customer records, account details, etc
- 4. In hospitals, to keep a record of patient details.
- 5. In libraries, to keep a record of books of different subjects according to their author name, date of issue, etc.

1.7 Basic Steps for Designing Database.

- 1. Determine the purpose of your database.
- 2. Determine the fields you need in the database
- 3. Determine the tables you need in the database
- 4. Determine which table each field belongs to
- 5. Identify the field or fields with unique values in each records
- 6. Determine the relationships between tables
- 7. Refine your design
- 8. Enter data and create other database objects

1.8 Database Models

The objective of a database model is to organize the data logically and physically. It also establishes and identifies the relationships between different records in the database.

The various database models are given here.

In this model, the data is arranged in a 'hierarchical' structure which describes the relationship of the records of the table in a 'tree-like' or 'parent-child' structure. In the hierarchical database model, every record has a single owner/ parent.



Figure 1.1 Hierarchical Model

Network Model:

The records in this model can be linked with many records. In other words, in this model a record can have multiple parents and child records.



Figure 1.2 Network Model

Unit 1

Relation model :

In this model the data is organized in the form of rows and columns to form a table and the tables can be related to each other for sharing the data.

The DBMS design based on a relation database model is known as the relational database management system (RDBMS).



1.9 Relational Database

For a successful business, fast access to information is critical.

You extract information from the existing data. Important decisions are based on the information available at any point in time. In order to get the right information at the right time, you store business-related data, in the form of text, numbers, pictures and sound, on a computer system. This aids in fast and easy access to information. Besides data access, organizing, adding, modifying and deleting data.

A Relational Database Management System (RDBMS) is a Database Management System that is based on the relational model as introduced by **Dr. Edgar F.Codd**. Strictly speaking it should also satisfy **Codd's 12 rules**, but in practice there is no DBMS that satisfies all these rules. Even, most successful DBMS that are considered to be relational model in several important ways, including the **Structure Query Language(SQL)**, do not satisfy Codd's 12 rules. Relational Database Management Systems stores data in the form of related tables, RDBMS are powerful because they require few assumptions about how data is related or how it will be extracted from the database. As a result, the same database can be viewed in many different ways.

An important feature of relational systems is that a single database can be spread across several tables. This differs from flat- file databases, in which each database is self contained in a single table.

Rule 1:	
	The information Rule
Rule 2 :	
	Guaranteed Access Rule
Rule 3 :	
	Systematic Treatment of Null Values
Rule 4 :	
_	Dynamic On-Line catalog based on the relational Model
Rule 5 :	
	Comprehensive data sublanguage Rule
Rule 6 :	
	View updating Rule
Rule 7:	
	High-level insert, up date and delete
Rule 8:	
	Physical Data independence
Rule 9:	
	Logical data independence
Rule 10 :	
	Distribution independence
Rule 11:	
	Integrity independence
Rule 12 :	
	Non subversion Rule.

DBMS	RDBMS
In DBMS relationship	In RDBMS, relationship between
between two tables or files are	two tables or files can be
maintained programmatically	specified at the time of table
	creation
DBMS does not support	Most of the RDBMS supports
client\server architecture	client/server architecture
DBMS does not support	Most of the RDBMS supports
distributed database	distributed databases
In DBMS there is no security	In RDBMS there are multiple
of data	levels of security.
	1. Logging in at o_s
	level
\land	2. Command level (i.e.
	at RDBMS level).
Each table is given an	Many tables are grouped in one
extension in DBMS	database in RDBMS
DBMS may satisfy less than 7	RDBMS usually satisfy more
to 8 of Dr. E F Codd's rules.	than 7 to 8 rules of Dr. E F codd
NAMING CONVENTIONS	\square
DBMS	RDBMS
Field	Column, Attributes
Record	Row, Tuple, Entity
File	Table, Relation, Entity Class

Difference between DBMS and RBDMS

Microsoft Access is the most popular and powerful Windows based software introduced by Microsoft Corporation. It is known as Relation Database management System. It is used to store large quantities of information. The database gives you the flexibility to obtain this data in multiple formats. Using MS-Access you can manage all your information from a single database in which you can add, update, delete, view and manipulate table data using online forms, find and retrieve data in a desired way using queries and print data in specific layout using reports. The database will have extension .MDS in MS-Access. Some other popular RDBMS are Sybase, sql (STRUCTURE QUERY LANGUAGE) In a Relation Database Management system like Microsoft Access, instead of storing all the information in one large table, different types of information can be stored in smaller tables. The tables are linked on common fields.



Figure 1.4 Linked tables in Relational Data Model

This is unlike flat file management program where data can be manipulated one table at a time only. The advantage of a relational database management system is that you can easily combine or extract data from several tables to get exactly the data that you need.

1.10 Elements of Relational Database

A table is a collection of data about a specific topic, such as business contacts or a book collection. The table is the basic element of the database. Tables organize data into rows, called records, and columns, called fields. Records and fields, combined, make up the table.

Each record (row) contains information about one item or entity and is a complete record of the item. For example in a table called student all the information about one student is in one row.

Each field (column) contains information of a certain type for all records. A field consists of a name or category such as First Name, Last Name Enrollment number etc.





Figure 1.5 Table Showing Records and fields

Many of the database will be small, with one or two tables. But as the database become braver, tackling bigger projects, it will be noticed that the design of the tables is proving problematic. This is done by database normalization, or the optimization of tables.

1.11 Normalization

Normalization is a process that helps analyst or database designers to design table structures for an application. The focus of normalization is to attempt to reduce data redundancy Through the normalization process, the collection of data in a single table is replaced, by the same data being distributed over multiple tables with a specific relationship being setup between the tables. By this process RDBMS schema designers try their best to reduce table data to the very minimum.

Normalization is carried out for the following reasons:

- 1. To structure the data between tables so that data maintenance is simplified.
- 2. To allow data retrieval at optimal speed.
- 3. To simplify data maintenance through updates, inserts and deletes.
- 4. To reduce the need to restructure tables as new application requirements arise.
- 5. To improve the quality of design for an application by rationalization.

Normalization is a technique that:

- 1. Decomposes data into two-dimensional tables
- 2. Eliminates any relationship in which table data does fully depend upon the primary key of a record
- 3. Eliminates any relationship that contains transitive dependencies.

A table is said to be in the 1NF when each field of the table contains precisely one value

Consider the following table Course

Faculty	Course	Department	Hour	
	id			
025	12	Computers	10	
	15		20	
	18		15	
029	16	English	25	
	18		30	
	17		i5	
031	12	Economics	5	
	15	~	25	
	16		20	

Table 1.1 Denormalized Table

The data in the table is not normalized because a cell in **Course_id** and **Hours** has more than one value.

By applying the INF definition to **Course** table, you arrive at the following table

Faculty	Department	Course	Hour
	_	id	
025	Computer	12	10
025	Computer	15	20
025	Computer	18	15
029	English	16	25
029	English	18	30
029	English	17	15
031	Economics	12	5
031	Economics	15	25
031	Economics	16	20

Table 1.2 Table in 1NF

Second Normal Form

The table is said to be 2NF when it is in 1NF and every attribute in the rows is functionally dependent upon the whole key. In the table for each value of **Faculty** there is more than one value of **Hours** hence **Hours** in not functionally dependent on **Faculty** similarly for each value of **Course _id** there are different values of **Hours**. However for a combination of **Faculty** and **Course_id** values there is exactly one value of **Hours** hence hours is functionally dependent on whole key **Faculty** and **Course_id**. To convert the table course in 2NF, you must remove attributes that are not fully functionally dependent on the whole key and place them in different table along with the attribute that it is functionally depend on . In the above example since the **Department** is not fully functionally dependent on the whole key **Faculty** and **Course_id**, you place **Department** along with **Faculty** in a separate table Department

Faculty id	Department
025	Computer
029	English
031	Economic

Tuble 1.5 Department			
Faculty	Course id	Hour	
025	12	10	
025	15	20	
025	18	15	
029	16	25	
029	18	30	
029	17	15	
031	12	5	
031	15	25	
031	16	20	

Table 1.3 Department

Table 1.4 Table in 2NF

Third Normal Form (3 N F)

A relation is said to be in 3 NF when it is in 2NF and every non-key attribute is functionally dependent only on primary key.

Consider the table Faculty:

Faculty	Department	DepHead
025	Computer	045
029	English	034
031	Economics	071
026	Economics	071
032	Computer	045
038	English	034

Table 1.5 Table in 2NF

The primary key in the **Faculty** table is **Faculty**. For each value of **Faculty** there is exactly one value of **Department** and exactly one value of **DepHead** hence both the attributes are functionally dependent on the primary key Faculty and all the attributes are functionally dependent on the whole key **Faculty** hence the table is in 2NF.

To convert the table Employee into 3NF, you must remove the column **DepHead** since it is not functionally dependent on only the primary Key Faculty and place it in another table **Head along with the attribute Depart-ment** which it is functionally dependend on.

Department	Dephead
Computer	045
English	34
Economics	071

Faculty	Department
025	Computer
029	English
031	Economics
026	Economics
032	Computer
038	English

Table 1.8 Table in 3NF

Table 1.7 Head

Disadvantage of Normalization

However the numbers and complexity of joints increases the increase in normalization. If the number of joints between the table increases, the performance of database decreases.

Denormalization

The end product of normalization is a set of related tables, which comprise the data. In such cases, it is wiser to introduce a degree of redundancy in tables either by introducing extra columns or extra tables. 1.12

The intentional of redundancy in a table is in order to improve performance and is called denormalization. This table structure has simplified the query add speed up the processing of the query. By storing extra columns you are introducing redundancy in the table but improving the performance of queries.

The decision to denormalize will obviously result in a trade –off between performance and data integrity .Denormalization also increase disk space utilization.

New Office Document IG MS **Invoking MS-Access** Cpen Office Document 1. Click the Start Accessories . Programs Þ Sta, tup Button on Task Bar Settings . Interactive Client Microsoft Access Search Microsoft Excel 2. Select **Programs** E Microsoft PowerPoint Help and Support option from Start Microsoft Word Run. z Menu Log Off Owner... ad Where are i 3. Click on Microsoft O Turn Off Computer Click here to view To turn this off, us Access. Aube PageMaker 7.0. start

Figure 1.7 Access Main Window

- 1 **Title Bar-** It shows the title of .mds file followed by the name of the program
- 2 Menu Bar It displays the name of the main menu.
- 3 DataBase Toolbar It has buttons that allow you to accomplish some selected task of frequient use.
- 4 Status Bar-It gives the information about the task presently going on..

Figure 1.6 Start Menu Options



5 Task Pane – The task pane is a small window in Ms-Access that provides a list of frequently used commands. The location and size of the task pane makes it convert to use these commands. There are several task panes in MS-Access when MS-Access application is started ,the **New Task** pane appears.

Self Assessment Questions

- 1. Define database in the light of its uses and advantages.
- 2. Explain in Detail RDBMS.
- 3. Mention the difference between DBMS & RDBMS
- 4. Explain the process of Normalization



^U ⁿ t 2 Creating Databases

Objective :

- u Disscussing different ways Creating Database
- u Explaning the Objects and Data Types used in MS-Access

Contents

- 2.1 Introduction
- 2.2 Creating a Database Using MS-Access
- 2.3 Open an Access Database
- 2.4 Close an Access database
- 2.5 Creating Data Base Using Blank Database
- 2.6 **Objects of a Database**
- 2.7 Data Types in MS-Access

2.1 Introduction

MS -Access provides two different ways of creating a database :- (1) using MS-Access Wizard and (2) Creating a database using Scratch, (Blank atabase).

2.2 Creating a Data Base using MS-Access Wizard

Microsoft Access provides two methods to create an Access database. You can use a Database Wizard to create in one operation the required tables, forms, and reports for the type of database you choose- this is the easiest way to start creating your database. Or you can create a blank database and then add the tables,forms, reports, and other objects later – this is the most flexible method, but it requires you to define each database element separately. Either way, you can modify and extend your database at any time after it has been created.

- 1. In the New File task pane, click General Templates in the New Form Template section
- 2. The Template Dialog box appears as in Fig 2.2.

Templates			\sim	? X
General Datab	bases			
Asset Tracking	Contact Managemert	Event Management	Expenses	Preview
Inventory Control Service Call Management	Ledger Ledger Time and Billing	Order Entry	Resource Scheduling	Select an icon to see a preview.
				OK Cancel

Figure 2.2 Template Dialog Box



Figure 2.1 Task Pane

- 3. Click the **Database tab.**
- 4. Click Expenses, and then click OK.



Figure 2.3 Save as dialog box

- 5. After giving name, say Expenses in this case, click **Create**. The database wizard appears with a list of tables created under the Expenses.
- 6. Click Next.



Figure 2.4 Database Wizard

- 7. The **List of Tables** along with corresponding fields appears in the database wizard.
- 8. Click the required table from the tables in the database box.
- 9. Click the fields to be added from the fields in the table box then click **Next.**

Tables in the database: Fields in the table: Expense report information Image: Department Name Expense Details Image: Department Name Expense Categories Image: Department Name Image: Department Name Image: Department Name Image: Department Name	The database you've chosen requires below, and may be in more than one to Do you want to add any optional fields	certain fields. Possible auditional fields able. ;?	are shown italic
Information about employees Expense report information Expense Details Expense Categories Imployee Number Imployee Number <	Tables in the database:	Fields in the table:	
	Information about employees Expense report information Expense Details Expense Categories		

Figure 2.5 Database Wizard

- 10. A list of styles appears and click the style from the what style would you like for screen Display? List. Select the style and click Next
- 11. A list of **Styles** for **printing reports** appears select one of these and click **Next**.

	_N	Blueprint Expedition		
***	-	Industrial Internationa	al	
		SandStone		
Label D	ata	Stone Sumi Paintin	g	

Figure 2.6 Database Wizard

- 12. Click a style from what style would you like for printing reports list.
- 13. Click next the database wizard asks the name of the database.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
NUMBER NUMBER<	Do you want a picture on all reports? Image: West of the second

- 14. Give the title, say Expenses in this case, and click next.
- 15. The next screen of the Wizard appears. Click **Yes**, start database. This makes sure that the new database created is opened after you Finish all the steps to create the database. Then click **Finish**.

	Database Wizard	Ň.
		That's all the information the wizard needs to build your database.
	No.	Do you want to start the database after the wizard builds it?
		Yes, start the database.
		🖵 Display Help on using a database.
I		ancel < Back Next > Einish

Figure 2.8 Database Wizard

- 15. As soon as you finish, the expenses database is created with all the required tables forms, reports corresponding to the database. **The Main Switchboard appears.**
- 16. The expenses database so created appears in the minimize state. Click maximize button to maximize it.
- 17. Now click the **Main Switchboard** and click on any option and see the various outputs.



Figure 29 Database Wizard

Firs	Name tName iress				Title Emplo Social Work	yee # Security # Phone	
City Sta Pos Cou	te/Province tal Code ntry/Region						
	Exp Rp	ot Name	Date Sub	imitte A	dvance	Total Expenses	Amount Du
•							

Figure 2.10 Expense Report by Employee (Form)

First Name	Ravi		Title	Junior Assiatar
Last Name	Mehera	15	Employee #	076
Address	Vishal Nagar		Social Security #	123-46-5879
			Work Phone	04123768
City	Kota		Part of the second	1
State/Province	Rajasthan	1		
Postal Code	305001	1		
Country/Region	India		1. 1	100
Exp Rpt	Name Date Subr	mitte Adv	vanca 🔰 Total Expens	ses Amount Due
		/	\sim	
		/		
(121		

Figure 2.11 Expense Report by Employee (Form)

- 18. Click on the Enter /View Expense Report Employee option on the Main Switch Board. The following form will appear. This is the First Form through which data is entered in the database tables.
- 19. Enter the data and click on the Expense Report Form. This the Second Form to enter data into the data base.

Expense Report ID Employee Name Exp Rpt Name Exp Rpt Descr	(AutoNumber) Ravi Mehera	Advance Expense Totals Balance Due Paid	\$0.0
Dept. Charged Date Submitted	4/14/2008 xpense Category	Description	Amount

Figure 2.12 Expense Report (Form)

B Main Switch	 Exnense Categories	5	
🖽 Expense Repor	Exhense carePoines		
Expense Repo	Exp. Category ID	1	\$450.00
Employee Nan	Expense Category	Perks	
Exp Rpt Name Exp Rpt Descr	Expense Account#	678	(\$450.00)
Dept. Charged Red	cord: 14 1	▶ ▶ ▶ ≭ of 1	
Date Submitted	4/14/2008		
Expense Date	Expense Category	Description	Amount
./ 4/8/2013	•		
	<u> </u>		
	\rightarrow		\frown
Preview Report			
Record:	1 1 1 1 1 of 1		

Figure 2.13 Expense Category (Form)

- 20. Enter data in the Expense Report Form. (Below the form their fill the table fields after filling all the entries of the Expense Report Form.)
- 21. Enter the data in the **Date Field** and then double click on the **Expense Categories Field.** The **Expense Categories Form** is displayed .This is the **Third Form** to enter the data.
- 22. After entering the data in the Expense Category Form and ----Table, click on the Preview Report button.
- 23. The **Report** for the **First Entered Record** is displayed with the picture on the top left hand corner which you inserted at the time of creating the forms through data base wizard.

Note:

The data for all the records related to the expense has to be entered in the same manner and the reports for the following can be generated in the similar fashion.

2.1.1 Adding a Item to Switch Board Items

🛚 Main Switchboard	
	Expenses

Figure 2 15 Main Switch Board

1. Select the option Change Switch Board Items from the Main Switch Board.

Switchboard gages:	<u>Close</u>
Main Switchboard (Default) Forms Switchboard Reports Switchboard	<u>N</u> ew
	<u>E</u> dit
	Delete
	Make Defau

Figure 2.16 Switch Board Manager

Main Switch Board - Fig 2.15

Forms Switch Board - The form gets open by clicking on the
Enter / View Other Information on the Main Switch Board.
Report Switch Board - The form gets open by clicking on the
Preview Reports on the Main Switch Board

- 2. Select the Main SwitchBoard (Default) option. (Fig 2.16)
- 3. Click on Edit option.(Fig 2.16)
- 4. The Edit Switch Board Page Dialog Box appears (Fig 2.17)

Edit Switchboard Page	\sim
Switchboard Name:	<u>⊂</u> lose
Items on this Switchboard:	New
Enter/View Extense Reports by Employee Enter/View Other Informacion Preview Reports	<u>E</u> dit
Change Switchboard Items Exit this database	Delete
	Move <u>U</u> p
	Move D <u>o</u> wn

Figure 2.17 Edit Switch Board Page

Edit Switchboa	rd Item			
<u>T</u> ext:	Report		ОК	1
<u>⊂</u> ommand:	Go to Switchboard	-	Cancel	1
<u>S</u> witchboard:	MainSwitchBoard	-		-
Report	abase	M	ove Up	
		Mor	ve D <u>o</u> wn	
-				

Figure 2.18 Edit Switch Board Item

- 3. Click on New option.
- 4 . Edit Switch Board dialog box appears. (Fig 2.18)
- 5. Enter the Text as Expenses (Fig 2.18)
- 6 Enter the command as Open form in add Mode. (Fig 2.18)
- 7 Enter Form as Expense Report SubForm. (Fig 2.18)
- 8. Click on ok button.(Fig 2.18)
- 9 The new switch board page (Expenses) is added to the list(Fig 2.18)
- 10. From the Edit Switch Board Item and Switchboard Manager dialog box click on Close Button. (Fig 2.18)

🗉 MainSwitchBoard	
	Enter/View Expense Reports by Employee Enter/View Other Information Preview Reports Expense Change Switchboard Items Exit this database

Figure 2.19 Main Switch Board

11. Now by clicking on the Expense option on the Switch Board the following form will open. (Fig 2.20)



Figure 2.20 Expense Report Form

2.3 Open an access database

- 1. On the File menu, click on the open option.
- 2. Click a shortcut in the left side of the open dialog box, or in the look-in box, click the drive or folder that contains the Microsoft Access database that you want.
- 3. In the folder list, double-click folders until you open the folder that contains the database. If you cant find the database that you want to open, click Tools on the toolbar in the open dialog box, and then click search. In the search dialog box, enter additional search criteria.
- 4. Do one of the following:
 - Double-click the database.
 - To open the database for shared access in a multi-user environment, so that you and other users can read and write to the database, click open.
 - To open the database for read-only access so that you can view it but cannot edit, click the arrow next to the open button, and then click open read-only.

- To open the database with exclusive access, click the arrow next to the open button, and then click open exclusive .
- To open the database for read-only access and also prevent other users from opening it, click the arrow next to the open button, and then click open Exclusive Read-only.

2.4 Close an Access database

On the file menu, click the button in the database window or press CTRL+W.

2.5 Creating Data Base Using Blank Database

- 1. In the New File task pane, click General Templates in the New Form Template section
- 2. The Template dialog box appears as
- 3. Click the General tab.
- 4. Choose Blank database option. Fig. 2.22 appeared.

Millosoft Access	
General Dat, hases	
Blank Blank Data Project Project (New Database)	Preview
	Select an icon to see a preview.

Fiigure 2.21 Templates Dialog Box

- 4. Now enter Student_information and click on Create button
- 5. The following window appears (Fig 2.23)



Figure 2.23 Database Access File Format

Object Toolbar : It has buttons to view existing database objects or create new ones.

Object Pane : Object pane has buttons to see various database object .For example if we want to see number of tables which have been created in a

data base we have to just click on the **Table Button**. In the similar way if we want to see how many forms have been designed in a particular database we have to click on **Forms** button.

2.6 Objects of a data base

Tables :

Tables are the building blocks of the database. Tables stores data . You can open the table in Datasheet View to enter data in it.Or, you can create a data entery form for the table.

Queries :

A query is either a question about the data stored in your tables or a request to perform an action on the data like **Appened**, **Edit**, **Delete**.

Forms:

Forms help in easy entery of data. A single form can be used to enter and display data from mulitple record source

Reports:

Report can be created for the different data base objects like queries and Tables.

Pages:

A data access page is a special type of web page designed for viewing and working with data from internet or an intranet - data that is stored in a MS-Access database or a MS- SQL Server database.

Macros :

Macros are small programs used to automate a repetitive task or set the database startup and exit code.
Modules :

Modules are the containers for any programming code written in an Access database.

2.6 Data Types in Ms-Access

Text :

The field can contain combination of text, numbers and special character but no calculation can be performed on the numbers entered in the field having the data type text like address, phone no, student id which have the combination of numbers and text. But these numbers are of the type on which we do not want to perform any calculation. It can store up to 255 characters, or length set by user in the Field **Size property**, whichever is less. Microsoft Access does not reserve space for unused portions of a text field

Memo:

The field is used for such data entries where the data, to be entered is not a single word but at least of two line. It can store up to 65,536 characters e.g : if a publisher maintains his database he may desire to write book description in the database. It can store up to 65,535 characters.

Number :

This field is used to enter only numbers. The numbers entered in this field can be used for calculation. It size is 1,2,4, or 8 bytes (16 bytes if the Field Size property is set to Replication ID

Date/Time:

Field is used for entering date and time. This data type stores 8 bytes.

Currency :

Field is used for currency values and prevents rounding off during calculations. It stores 8 byte.

Auto Number :

Automatically generates(and fills itself with) a number every time a new record is created. It generally takes 4 bytes (16 bytes if Field Size property is set to Replication ID)

Yes/No :

For those situations when you need a simple yes/no answer (or true/false or on/off). size is 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 a Microsoft Access table. Up to 1 gigabyte (limited by available disk space)

Hyperlink :

Text or combinations of text and numbers stored as text and used as a hyperlink address. A hyperlink address can have up to three parts text to display- the text that appears in a field or controlAddress- the path to a file (UNC path)or page(URL)Sub address-a location within the file or page.Screen tip – the text displayed as a tool tip The easiest way to insert a hyperlink address in a field or control is to click Hyperlink on the insert mean each part of the three parts of a Hyperlink data type can contain up to 2040 characters

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 look up field. After you complete the wizard Microsoft Access sets the data type based on the values selected in the wizard .

Self Assessment Questions

- 1. Write the different ways of creating a database.
- 2. Mention the various objects which are present in the database window.
- 3. Mention the different datatypes used in Access.



^{*U*} *i t Creating Tables*

Objective :

- u Discussing the different ways of Creating Tables
- u Explaning the different methods of Modifying the Existing Table

Contents :

- 3.1 Introduction
- 3.2 Steps for Creating a Table using wizard
- 3.3 Creating a Table in design view
- 3.4 Creating a Table using Datasheet View
- 3.5 Modifications in a table

3.1 Introduction

In MS-Access data is stored in data tables. As MS-Access provides a facilite to create a database using wizard .In the same way it provides a facilite to create a table using wizard.

3.2 Steps for creating a table using wizard

1. Open the already existing database "Student_information"

👬 Open 🕍 Design	Mew X 2
Objects	Create table in Design view
Tables	Create table by using wizard
📰 Queries	Create table by entering data
🔳 Reports	
Pages	
🔁 Macros	
At Modules	

Figure 3.1 Main Access Window

- 1. Select **create table by using wizard**, from the **Database** dialog box. The Table Wizard dialog box appears.
- 2. Select either **Business or Personal**, depending upon the kind of table that you want to create.
- 3. To add a field from the sample list, double click on the field name, or click on the field name and then on '>' button present on the dialog box. To include all the fields from the list, click on the '>>' button.



- 4. To remove a field after initially including it, click on it in the right most list, then click on the ' < ' button. Clicking on '<<' button removes all the fields.
- 5. After including all fields in the new table, click Next
- 6. Default name given by the wizard appears in the text box you can change to the name of your choice, (for example **Student**). Wizard by default sets a primary key for the table.
- 7. Click on the Next Button.

able Wizard	
<u>W</u> hat do you want to n Students	ame your table?
1 XXX XXX XXX 2 XXX XXX XXX 3 XXX XXX XXX 4 XXX XXX XXX 5 XXX XXX XXX	Microsoft Access uses a special kind of field, called a primary key, to uniquely identify each record in a table. In the same way a license plate number identifies a car, a primary key identifies a record. Do you want the wizard to set a primary key for you? Ýes, set a primary key for ne. Ýo, I'll set the primary key.
	Cancel < <u>B</u> ack <u>N</u> ext > <u>F</u> inish

- 8. Dialog box in (Figure 3.4) appears by choosing the first option. The Table opens in Design Veiw (Fig 3.5) from where various field properities for the table can be set.
- 9. By clicking on the second option the table opens in the Datasheet View. (Fig 3.6).



Figure 3.4 Table Wizard

StudentID FirstName	Data Tuno	Description	3
FirstName	AutoNumber	Description	
	Text		
LastName	Text		
Address	Text		
PhoneNumber	Text		
EmailName	Text		
		Field Properties	
General Lookup			
Field Size	50		
Format			
Input Mask	-		
Caption Default Value	First Name		
Validation Rule		A Rold page and to be 64 structure law to the state	
Validation Text		A neiginalitie can be up to be characters long, including spaces. Press H1 rol help on held hames.	
Allow Zero Length	NO		
Indexed	No		
Unicode Compression	No		
IME Mode IME Sentence Mode	No Control None		
it Auxiber)			
e Sibe	dents	Figure 3.6 Table Datasheet Veiw	
ड Stor	dents Ident ID	Figure 3.6 Table Datasheet Veiw	
Stur Firs	dents Ident ID It Name	Figure 3.6 Table Datasheet Veiw	
Stur Stur Las	dents Ident ID It Name It Name	Figure 3.6 Table Datasheet Veiw	
Since Stur Firs Las Par	dents Ident ID It Name It Name It Name	Figure 3.6 Table Datasheet Veiw	
Stu Firs Las Par Add	dents Ident ID It Name It Name Itents Names dress	Figure 3.6 Table Datasheet Veiw	

Figure 3.7 Form View of table

1 ▶ ▶ ▶ ▶ ■ ▶ ★ of 1

Record: I◀ I ◀ | Ţ

10. By clicking on the third option the table opens in the Datasheet View. (Fig 3.7).

3.3.1 Creating the table in the Design View

™ ⊇	oen 🕍 <u>D</u> esi	ign ዀ	<u>v</u> ew × ^p	B- B-B-		
	Objects	2	Create table in [Design viev/		
	Tables	2	Create table by	using, wittard		
	Queries	2	Create table by	entering data		
==	Forms		Students			
•	Reports					
1	Pages					
2	Macros					
	Modules					
- 3*	Groups	-				
	sruaps					
er coft Acc cs Ele Eat View - I State State	Favorites	Fiz	gure 3.10 ™ ३ ⇒ ∎ > ■	Database	e Window	W Type a question for h
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n soff Acc es Je Gat Yukw Pe Gat Yukw Field Name	Tables : Table Insert I Lods Winds Date Type	File w Bob	gure 3.10 ₩ ३३ 🗈 🖻	Database	e Window	Type a question for h
e contace es le Edit Virw ■ Bi Se Fiel Name	Tablet : Table reset Loois Winds Deta Type	Fiz	gure 3.10 ▶ > ► @ > @	Database ≉_• ②. Description	e Window	W Type a question for h
A confine of a	Favorites	Fig.	gure 3.10	Database	e Window	W Type a question for h
Crivert Accies	Favorites	Fiz	gure 3.10 ♥३₽ €≙ €	Database	e Window	W Type a question for h
cr wort Acc as Ele Eat Mark Fiel None	Tablet : Table Tester I. Look Windo Deta Type	Fiz	gure 3.10	Database	e Window	W Type a question for h
Free Vorte Act of State	Favorites		eure 3.10	Database	e Window	W Type a question for h
Re (von net es Ele Est ylive Fiel Name	Favorites		gure 3.10	Database	e Window	W Type a question for h
Ict votil and visit Ere Ede Sch Vicv Field Name	Favorites		eure 3.10	Database	e Windov	W Type a question for h

Figure 3.11 Design View of table

- 1. Double click on the Create table in Design Veiw option
- 2. The following window appears. (Figure 3.12)
- 3. In the **Field Name Coloum** enter **Feild Name**. Choose the data type from the list of datatypes suggested .



Figure 3.12 Selecting the Datatype

Defining Primary Key

Choose Primary Key option from the Edit Menu or click on the primary key option on the Standard toolbar.

	Edic	<u>View Insert T</u> ool	s <u>W</u> indow	Help
-	K)	Undo Property Setting	Ctrl+Z	• CH - (?) = ==
	Ж	Cut	Ctrl+X	
trtyhy		Copy	Ctrl+C	
	•	Office Clip <u>b</u> oard		
	8	Paste	Ctrl+V	
		Select <u>A</u> ll	Ctrl+A	
		Delete	Del	
		Primary <u>K</u> ey		

Figure 3.13 Defining Primary Key

3.3.2 Creating Look Up List

a). Select LookUp Wizard... Datatype from the list of data types the LookUp Wizard Dialog Box appears.

Lookup Wizard	
	This wizard creates a lookup column, which displays a list of values you can choose from. How do you want your lookup column to get its values? I want the lookup column to look up the values in a table or query. I will type in the values tha'. I want.
	Cancel < Back Next > Einish

Figure 3.14 Lookup Wizard(step 1)

- b). Select the option **I** will type in the values that I want and click on the Next Button.
- c). Fill the following list for the Lookup Wizard and click on Next Button.(Fig 3.15)

what values do you want to see in your lookup column? Enter the number of columns you want in the list, and then type the values you want in each cell.					
To adjust the width of a column, drag its right edge to the width you want, or double-click the right edge of the column heading to get the best fit.					
Nur	mber of <u>c</u> olumns:				
	Col1				
	B.C.A				
	P.G.D.C.A				
	M.Sc				
	M.C.A				
	BASIC				
	OPERATING SYSTEM				
I	LANGUAGES				
1	1				

Figure 3.15 Lookup Wizard(step 2)



Figure 3.16 Lookup Wizard(step 3)

- d). The Wizard suggest you a default label for your list You can change it if you desire.
- e) Then click on **Finish.**

3.3.3 Field Properties

• Field size:

This property helps you in setting the size for the field name. If first name is the field name that means you can change to 15 instead of keeping the default value as 50, because generally name do not have more then 25 characters. If you want to set the field size maximum of 5 characters. This will help in unnecessary blockage of computer memory .

• Field Format:

This determines how the data will appear after it has been entered. Four types of different format which can be applied are:

- 1. Text 2. Date and Time
- 3. Currency 4 .Yes and No

Format	Entry	Display	Remark
<	Room	room	<pre><converts characters="" lower<="" pre="" to=""></converts></pre>
			case
>	room	Room	> converts characters to upper
			case
@-@@	572	572	@indicates a required
			character or space
@\#	Bye	Bye#	\adds character at the end

1. Text and Memo Format

Table 3.1 Text and Memo Formats

2. For date / Time and currency Format, different formats are suggested by the computer and you can apply any according to your requirements.

General Lookup Formac Input Mask	General Date	6/19/1994 5:34:23 PM	(*)
Caption Default Value Validation Rule Validation Text Required Indwxed	Medium Date Short Date Long Time Medium 7 ims Short 7 ims	5:34:23 PM 5:34 PM 17:34	
IME Mode	No Control		
INE Sontence Mode	Nona		

Figure 3.17 Date Formats (step 3)

3. Yes / no format

The Format property provides the Yes/No. True/False, and On/Off predefined formats. Yes, True, and On are equivalent, as are No,

False, and Off.

If you specify one predefined format and then enter an equivalent value, the predefined format of equivalent value will be displayed. For example, if you enter True or On in a text box control with its Format property set to Yes\No, the value is automatically converted to Yes.

Steps for applying

- 1. Enter the field name in field name column
- 2. From the data type column choose any one out of three
- 3. From the field properties pane select under general tab select format and enter the desired format.
 - Decimal places :

This property allows you to set number of digits to be displayed to the right of a decimal point.

Steps for applying

- 1. Enter the field name in Field Name column
- 2. From the Datatype column choose Number.
- 3. From the field properties pane under General tab select format option and click on arrow to see the drop down list..
- 4. Select from the list a number to specify the digits that will be present after the decimals.

• Input Mask

- An input mask controls the value of a record and sets it in a specific format. They are similar to the format property, but instead they display the format on the datasheet before the data is entered For example, a telephone number field can be formatted with an input mask to accept ten digits that are automatically formatted as "(645) 123-5147". The blank field would look like(---) --- . To use the input mask to a field follow these steps.
- In design view, place the cursor in the field that the input mask will de applied to.
- Click in the white space following input mask under the general tab.
- Click the "-----" button to use the wizard or enter the mask,(###) ###-####, into the field provided.

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

The following symbols can be used to create an mask from scratch:

Table 3.2 Input Mask Format (step 3)

Caption:

This property helps you to set a label for your field which will appear when you see it on screen or when you enter data through form in a database. It can have minimum 2048 characters.

Default value :

You can set a default value for any of your fields Default value property at any stage. It does not apply to existing records also the property cannot to applied for auto number and ole object data types.

Field validation:

The main purpose of applying this rule on a field is to avoid entry of wrong data. For example, if you have applied the validation Student _id cannot be greater then 40 and less then 10, if the user enters a number greater then that you will be wanting to generate a error or a warning so that the wrong data entry can be corrected. That can be achieved using Validation text field **property.**

Steps for applying

- 1. Enter the field name in Field Name column
- 2. From the DataType column choose Number
- 3. From the Field Properties pane select under General Tab select Validation Rule option and click on (.....) button
- 4. The expression builder dialog box appears.(Fig 3.18)
- 5. Frame the expression as in the (Fig 3.18) by clicking on buttons and then click on Ok.

				Canc
				Und
+ - / * & =	> < <> And Or No	t Like ()	Paste	Help
Diperators				

6. Enter the Validation Text (Fig 3.19)

Figure 3.18 Expression Builder

Required:

This property defines that the field can be left blank or not if the required purpose is set to yes then user is required to enter the data in the field properly and cannot leave the field blank. But if the user wants to allow null value then user should set the required property as no.

General Lealure	
Сепегаг Соокцр	
Field Size	2
Format	00
Input Mask	
Caption	Course_Id
Default Value	
Validation Rule	>10 And <30
Validation Text	Please Check the Course_id
Required	Yes
Allow Zero Length	No
Indexed	Yes (No Duplicates)
Unicode Compression	Yes
IME Mode	On
IME Sentence Mode	None

Figure 3.19 Validation Text

Allow zero length:

Sometimes, there may not be any data available for a particular field in a particular record. For example, in the field Spouse name, the field has to be empty for unmarried people. At other times, correct data may not available. For example, for the field Car Registration Number, you may not have the number. For this, there are two option.

Required	Allow zero iength	User's action	Value stored
yes	nc	Presses SCPACEBAR	Not Allowed
		Presses ENTER	Not Allowed
yes	yes	Enter a zero length	Zero-length
		string	string
		Presses SCPACEBAR	Zero-length string
		Presses ENTER	Not allowed
No	No	Enter a zero length string	Not allowed
		Presses SCPACEBAR	Null
		Presses ENTER	Null
No	Yes	Enter a zero length	Zero-length

Table 3.3 Effect of combining the two properties

"None" and "I do not know." For none, enter a zero length or null by typing two double quote marks with no spaces between them (""). For "I don't know, simply skip the field.For Access to recognize " ", set Allow Zero Length characters option to yes, the Required option to No, and leave the Default value option blank.

The Tables 5.8 shows the result that you can expect when you combine the settings of Required and Allow Zero Length properties.

4. After applying all the formatting click on the Save button a dialog Box will appear asking you to save the file click on the yes option and in the save as dialog Box enter the name for the table and save it

3.3.4 Indexing a table

An index helps Ms-Access find and records faster. It uses indexes in a table as you use an index in a book: to find data, it looks up the location of the data in the index. You can create indexes based on a single or multiple fields. Multiple indexes enable you to distinguish between records in which the first field may have the same value.

Create a Single-field index

- 1. Open a table in Design View.
- 2. In the upper portion of the window, click the field that you want to create an index for .
- 3. In the lower portion of the window, click in the Indexed property box, and then click yes (duplicates ok) or yes (no duplication)

Create a multiple-field index

- 1. Open a table in Design View.
- 2. Click Indexes on the toolbar.
- 3. In the first blank row in the Index Name column, type a name for the index. You can name the index after one of the index fields, or use another name.

- 4. In the Field Name column, click the arrow and select the first field for the index.
- 5. In the row in the Field Name column, select the second field for the index. (Leave the Index Name column blank in that row.) Repeat this step until you have selected all the fields you want to include in this index

Delete an Index

- 1. Open the table in Design View
- 2. Click Indexes on the toolbar
- 3. In the Indexes window, select the row or rows containing the index you want to delete and press the delete key. It will remove only the index, not the field.

3.3.5 Modifying feilds in a table

I Changing Feilds Name in a table

- 1. Open the database in which the table is present.
- 2. Select the object Table under the object pane.
- 3 Select the table and click on the Design icon on the Object toolbar
- 4. Click on the Field Name coloumn ,delete the existing name and type the new name.
- 5. Save the table.

II Deleting the Field Name

- 1 Open the database in which the table is present.
- 2 Select the object Table under the object pane.
- 3 Select the table and click on the Design icon on the object toolbar.

- 4 Click on the row header of the field, from the keyboard click on the delete button. from the keyboard. or click delete option from the Main Menu.
- 5 Save the table.

III Inserting a New Field

- 1 Open the database in which the table is present.
- 2 Select the object Table under the object pane
- 3 Select the table and click on the Design icon on the object toolbar
- 4 Select the Insert Menu and click on Row option .A new row is inserted.
- 5 Save the table.

IV Changing the Sequence of the Field

- 1 Open a existing database
- 2 Select Table and click Design icon from the database window.
- 3 The table is opened in Datasheet view
- 4 Click the field and drag towards its new location.
- 5 The field is moved to a new location
- 6 Save the table

Note:

"Create table using design view". option in the same database Student_Information with the name Faculty

i.				
		Field Name	Data Type	
	8	Faculty_id	Text	
		Faculty_name	Text	
		Department_Headed	Text	
		Department_id	Text	
1				



Table 3.5 Faculty Table Feild Settings

Ì		Faculty_id	Faculty_name	Department_Headed	Department_id
	•		Nitesh	Geography	035
	ł	121	Kumar Sanu	Computers	045
	ł	134	Rohan	History	034
Γ	ł	165	Ria Sethi	English	012
	ł	167	Kajal	Economics	064
Γ	ł	185	harish	Maths	065
	ł	189	Seema	Science	061
÷	ŧ				

Table 3.6 Faculty Table Data

Open the table **Student** created using table wizard in **design view** and **add two more field** to it **a**) **Course_id b**) **Department_name**

	Field Name	Data Type
8	StudentID	Text
	course_id	Text
	FirstName	Jext
	LastName	Text
	Department_name	Text
	ParentsNames	Text
	Address	Text
	PhoneNumber	Text
	EmailAddress	Text

Table 3.7 Student Table Feilds

Data Validations:

- 1 None of the feilds should be blank expect EmailAddress. It may or may not have the data.
- 2. Student_id should not have duplicate values.

ſ		Student ID	course_id	First Name	Last Name	Department_nar P
-		123	12	Anu	Sharma	Computers
		124	12	Rahul	Jain	Computers
		125	15	Mili	Mehera	Computers
		126	16	Kirti	Joshi	Computers
		127	18	Reha	Khan	Computers
		128	12	Angali	Sharama	Computers
		129	18	Abhishek	Joshi	Computers
	Ø	130	13	Ankit	lal	Computers
7	¥					

 Table 3.8 Student Table Data

You can enter the data of the remaining fields according to your choice.

Create a table in the same database **Student_Information** with the name **Course** using any one of the two methods.

	Field Name	Data Type
₽₽	Course_id	Text
	Course_name	Text
	Course Duration	Text
	Course_fee	Number
	No_enrol	Number

Field Name Course_id	Course_name	Course_Duration	Course-Fee	No_enroll
Data Type Text	Text	Text	Number	Number
Field Size 10	15	10	8	2
Format				\sim
Decimal Places			2	0
Input Mask				0
Default Value				
Validation Rule				<=40
Validation Text				Seats are full
Required Yes	Yes	Yes	Yes	
Allow Zerc				
Length				
Indexed Yes(No	Yes(No			
Duplicates	s) Duplicates)			

Table 3.9 Course Table Data

Table 3.10 Course Table Feild Settings

					1	1 1
		Course_id	Course_name	Course Duratior	Fee	No_Enroll
►	+	12	B.C.A	3 Year	400000	34
	+	13	CBJECT OR	1 Year	100000	23
	+	14	M.S.c	2 Year	500000	39
	+	15	M.C.A	3 Year	500000	35
	+	16	BASIC	6 Months	90000	30
	+	17	OPERATING	6 Months	120000	28
	+	18	LANGUAGE:	2 Year	200000	38
	+	19	P.G.D.C.A	2 Year	90675	39
*						0

Table 3.11 Course Table Data

Creating a table using Datasheet View.

- 1 Double-click Create table by entering data in the Database Window. or
- 2 Click New on the database window toolbar. This displays the New Table dialog box.
- 3 Select the Datasheet View from the available list and click ok to close the New Table dialog box.

New Table	? X
Create a new table in Datasheet view.	Datasheet Wew Design View Table Wizard Import Table Link Table
	OK Cancel

Figure 3.19 New Table Dialog Box

Field1	Field2	Field3	Field4	Field
1 1 1				

Figure 3.20 Datasheet View of the table.

5. Same the table 3.22.

Enter the following data as given in (Figure 3.12)

_		1	
	Faculty_id	Department_nar	Department_id

Figure 3.21 Table after giving feild names



Figure 3.22 Save As dialog box

	Bepartment : Table						
			Faculty_id	Department_nar	Department_i		
1	◄	+	121	Computers	045		
I		+	165	English	012		
I		+	134	history	034		
I		+	185	Maths	065		
		+	189	Science	035		
	*						

 Table
 3.12 Department Table Data

Unit 3

3.5 MODIFICATIONS IN TABLE DATA

Adding a new record

To add a record in table Datasheet view, select any one of the following 3 options.

- Select New Record from Insert menu.
- Click on the last blank record.

The last row displays an asterisk in the record selector. This indicates that the row is really not a record, it is a place to add new records to the table. When typing in the last row, asterisk turns into the normal triangle record marker.

Deleting a record

To delete a record in table Datasheet View, select any one of the following methods.

- Click on the records gray selector and select Delete from Edit menu.
- Click on the records gray selector and click on Cut button in the tool bar.
- Click on the records gray selector and press Delete key
- Right click on the record selector and select Cut from short cut menu.

Sorting the data

The records displayed in Datasheet View can be sorted in the ascending or descending order of a field. To sort the records, select any one of the following two methods.

- Click on the field, Click on sort ascending or descending button.
- Click on the field and select Quick Sort Ascending or Quick Sort Descending from menu from the dialog box displayed. select the desired font style and size and click on OK. The whole table content will be displayed in the selected font.

Changing the Column width

By default, all columns will de displayed with the standard width 18.8. To change the column Width from menu. The following dialog will be displayed.

- Type the column width number and click on OK
- After changing the column width, to set the default width of the column, click on the column and select standard width check box from the column width dialog.
- To set the column width based on the largest content in that column, click on the column and select best fit from the column width dialog or double click on the right column heading border of the column.
- The column width can also be changed by dragging the right column heading border of the column.
- After changing the row height, to return to the default row height, select standard height from the Row height dialog.

Changing the Row Height

By default, all rows are displayed in the datasheet view in the standard height 10.5.

To change the row height, click on any row, select **Row height** from **Format Menu**. The following will be displayed.

• Type a desired row height number and click on OK.

All rows will have the same row height.

• The row height can also be set by dragging the top border of any one of the gray record selector on the left side of the datasheet window.

Freezing Columns

• When there are many fields in a table, all fields cannot be displayed in the datasheet window. But for the purpose of displaying the content of many field always on the screen, even when scrolled to the right, the fields can be frozen.

- To freeze a column, click on the column which is to be frozen and Select Freeze Columns from Format Menu.
- The column will move to the far left of the datasheet window and freeze.
- To freeze more than one column, repeat the steps for each new column.
- To unfreezing the columns, the columns will not move to their original position.
- To keep them in original position, select no to save the changes to the table layout.

Hiding Columns

- By default, the datasheet window displayed all field contents in different columns if a particular field content is not to be displayed, that column can be hidden.
- To hide a column, click on the column and select **Hide Columns** from **Format Menu**.
- To unlide the columns, which are hidden.

Select Show Columns from Format Menu

- Available fields in the table in the table will de displayed in a dialog. The hidden columns will not have a tick mark at its left.
- Click on the field name and click on show button.
- After selecting the columns to be displayed.
- Click on close button.

Removing the Grid lines in Datasheet View

- To remove the grid lines in the datasheet view, Select Grid Line from Format Menu.
- The grid lines can be displayed again by selecting **Grid Lines** from **Format Menu.**

Restrict Editing

- By default the content of a table can be edited in the datasheet view. To restrict editing, deleting and adding the contents into the table
- De-select allow Editing from Records Menu.
- To allow editing the records, select the same option again.

Inserting/deleting a field in the table structure

- Open the table design window.
- Click on the field, the position at which the new field is to be inserted and select Insert Row from Edit Menu.
- To delete a field from the table.
- Click on the name in the Table Design View and
- Select Delete Row from Edit Menu.

Modify Records

- To replace an entir e field value points the mouse to the beginning of the field value.
- When the mouse pointer changes to a large plus sign.
- Click to highlight the field.
- Type the new value. It will replace the old one.
- Instead of making time-consuming, repetitive changes one at a time, you can find and replace data in a table using. Find and replace.
- For this, the cursor should be in the field you want to edit.

Edit Special Fields

Here is how you can enter and edit data in the fields with following data types : Memo: In datasheet view you can directly enter text in a memo

field. However you will have to open a Zoom window if you wish to see the contents of the entire field. To do so.

- Click anywhere in the memo field
- Press shift +F2
- Click OK to save your work or Cancel to abandon the changes.

Dates and Times

• The date/time fields are easy to work with The only things that can cause problems are the data separators. Hence you have to pay attention to the input masks.

Yes\No fields

• These are easy to handle since Ms-Access depicts them as check boxes.

OLE Objects

• Fields with Ole objects can hold pictures, Word Documents, sound or any other kind of data that is created in programs outside MS-Access

Hyperlinks

In Hyperlink field you store hyperlink addresses that let you jump to web sites, database objects or other office documents. You can enter the addresses in any of the following ways:

- Use the insert hyperlink button on the table datasheet toolbar.
- Copy and paste the hyperlink address.
- Drag and d rop the Hyperlink address.
- Type in the Hyperlink address.

Self Assessment Questions

- 1. Explain the three different ways of Creating a table.
- 2. Write a short note on Lookup Wizard
- 3. What is use of indexing a table and defining a primary key?
- 4. Explain in detail the different field properties.





Creating Relationship

Objective :

- u Disscussing the components of database used in creating relationship
- u Explaining the different types of relationship and the methods of their creation

Contents

- 4.1 Introduction
- 4.2 Components of a table
- 4.3 Different Types of Relationship
- **4.4 Key**s
- 4.5 Data Integrity
- 4.6 Creating Relationship
- 4.7 Viewing Data.

4.1 Introduction

Tables created in Access or any RDBMS for the logical representation of data are to be related which help in reducing data duplication and maintaining data integrity. It becomes easier to retrieve information from the related information as we need to only use a single query to reterive information a times a single form or report can very easily prepared to view data two different tables.

4.2 Components of a Table

Entity :

An entity is an object with a distinct set of properties that is easily identified. Entities are building Blocks of a datbase. The entities of Student_Information Database are Course, Faculty,Department An entity is represented using a Rectangular Box.



Figure 4.1 Entity

Attribute :

An Attribute is a property of an entity that differentiates it from other entities and provides information about entity. In ER diagram you represent attributes as ellipses and label with the name of the attribute.

Tuple :

A Relation consists of number of rows. These rows are called records or tuples.



Degree :

The total number of columns associated with a table or relation is called the degree.

Cardinality :

The total number of rows associated with a table or relation is called the degree.

In a Relational Databse a relationship is a crucial part of the design of a database. It is used to establish a connection between a pair of logically related entities. It is an association between entities . Separate entities can

\downarrow	Student ID	First Name	Last Name	Course	Parents Names	Address	Phone No	EmailAddre
		, Anu	Sharma	B.C.A	Ravi Sharma	RamGanj	1234567890	anu@yahoo
		Rahul	Jain	B.C.A	Ajay Jain	Vashali Nagar	0987654321	Rahul@yah
Τ		Mili	Mehera	M.c.a	Kamal Mehera	New Road	2343565789	Mili@yahoo
	• 126 •	Kirti	Joshi	M.Sc	Nitin Joshi	Kala Bagh	1234569776	Kirti@yaho

Cardinality of the relation 4

Degree of a relation 8

Figure 4.3 Components of Table
have relation with each other **For example students study various courses, the entities are student and course while the relationship between them is studies**. You represent a relationship between two entities using diamond labeled with the name of the relationship. Entity Relationship (ER) diagram is a tool to build the logical database design of a system .An ER diagram represents the following relationship

4.3 There are three types of relationship

One-to-One (1: 1) Relationship

Two entities have a one to one relationship if every record in first entity has only one matching record for the second entity.



One-to-many (1: m) or Many -to-one(m: 1)

Two entities have One-to-many or Many -to-one if every record of first entity ,there can be zero one or several records of second entity , and for every instance of second entity there is exactly one instance of the first entity.



Figure 4.5

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Many-to-Many(m:m)

Two entities are related in many-to-many relationship when every record of the first entity ,there can be multiple records of the second entity, and for every instance of the second entity there can be multiple instances of first entity.



As you have studied that a relational data model enforces data integrity this is achieved by defining various keys.

4.4 Keys

Candidate Key

A attribute or set of attributes that uniquely identify a row is called a candidate key. This attribute cannot have duplicate value.

	TÌ	Faculty_id	Department_nar	Department_id
D	+	121	Computers	045
	+	165	English	012
	+	189	Science	034
4				

Figure 4.7 Department Tab	le
---------------------------	----

For Example, in the Relation Department all the attributes can be considered as candidate key because there can be only one department for every discipline and it can only have one head and every head is going to have a different id. None of them can have a duplicate value thus they can be made as a candidate key.

Primary Key -

The candidate key which you choose to identify the row uniquely is called a Primary key.(E.g Department_Name).

Alternate Key -

A candidate Key that is not chosen as Primary key is called an alternate key.(E.g Department _id)

Foreign Key -

When a Primary key of one table appears as an attribute in another table, it is called the foreign key in the second table. A foreign key is used to relate two tables. (E.g Faculty_id as it is a primary key in the Faculty table.)

		Faculty_id	Faculty_name	Department_Headed	Department_id
►	+	055	Nitash	Geography	035
	+	121	Kumar Sanu	Computers	045
	+	134	Rohan	History	034
	+	165	Ria Sethi	English	012
	+	167	Kajal	Economics	064
	+	185	harish	Maths	065
	+	189	Seama	Science	061
*					

Figure	4.7	Facul	lty !	Tabl	e
0			~		

4.5 Data Integrity

Entity Integrity

Entity integrity that each row can be uniquely identified by an attribute called the Primary key. The Primary key cannot have a NULL value.

Domain Integrity

Domain integrity refers to the range of valid entries for a given column. It ensures that there are only valid entries in the column.

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Referential Integrity

Referential integrity ensures that for every value of a foreign key, there is a matching value of the primary key.

4.6 Steps to create Relationships

1 Select Tools Menu and click on Relationship option

how Table	?≀
Tables Queries Both	Add
Course	Close
Faculty Students	

Figure 4.8 Show Table Dialog Box

2 From the **Show Table** dialog box select the tables for which you want to create relationship.



Figure 4.9 Tables for Creating Relationships

3. Create a relation ship using Faculty and Department Relation with the field Department_Head in the Faculty Relation and Department _Name in Department.

Note : That though the field names are different but they will contain the same value in both the tables.

- 4 Drag the field from the faculty and drop it on the field in the Department with which you want to create relation ship between both the tables.
- 5 As you leave the mouse button the following dialog box appears .Tick the first check box .The Edit Relationship dialog box also shows the type of relationship which will be created.

Table/Quary: Related Table/Quary:	Create
Faculty Department	
Department_Heade Department_name	
	Join Typ
	✓
Enforce Referential Integrity	Create Ne
🗖 Cascade Upoiate Related Fields	
Cascade Delete Balater Records	

Figure 4.10 Edit Relationship dialog box.

- (a) A **one to one** relation ship is created as **one department** can only have **one head** and **one person** can be the head of only one department. (Fig. 4.11a)
- (b) Following the same process relation between **Course** and **Student** table can also be created. (Fig 4.11b)

A one to many relationship is created as **number of students** can can get **enrollement** in the **same course** but a student can get admission only in **one discipline.**

(c) Creating Many to Many Relationship For creating this type of a relation ship we need to have a junction table.

In the junction table, set the **primary key** to include the **primary key** fields from the other **two tables.**

For example, in a **Student** junction table the primary key would be made up of **course_id**



Figure 4.11 Relationship

4.7 Viewing Existing Relationships

- 1. Press F11 to switch to the **Database** window.
- 2. Click **Relationships icon** \square on the toolbar.
- 3. Do one of the following:
 - View all relationships defined in the database
 - Click Show All Relationships icon
 - View the relationships defined for a particular table
 - Click the table, and then click **Show Diret Relationships** on the toolbar.
 - View only the relationships defined for one table without viewing the relationships defined for tables.
- 2. To add the table back, click **Show Table** icon on the toolbar, double-click the table, and then click close.
- 3. Click Show Direct Relationships on the toolbar.

Edit or Delete a Relationship

- 1. If any table is open, close it first. You cant create or modify relationships between open tables.
- 2. Press F11 to switch to the database window.
- 3. Click Relationships on the toolbar.
- 4. If the tables whose relationships you want to delete or edit aren't displayed, click Show Table on the toolbar and double-click each Table you want to add. Then click close.
- 5. Right-click the Relationships line, select any of the following:
- 6. Click the Delete option or press Delete Key to delete relationship. Click the Edit Relationship option to edit the relationship



Unit 5

^U ⁿ t 5 Queries and Filters

Objective :

- u Explaning the concepts of Queries and F ilters
- u Discussing the different ways of creating Queries and applying Filters

Contents

- 5.1 Select Queries
- 5.2 Parameter Queries
- 5.3 Crosstab Queries
- 5.4 Action Queries
- 5.5 Creating Simple Select Queries
- 5.6 Passing parameters to query
- 5.7 Use of AND operator
- 5.8 Creating Query Using Wizard
- 5.9 Passing Parameters to query at runtime
- 5.10 Using Calculated fields in the Query
- 5.11 Query Linked Tables
- 5.12 Finding Duplicate Values
- 5.13 Finding Unmatched Data
- 5.14 Action Queries
- 5.15 Filters

You use queries to view, change, and analyze data in different ways. You can also use them as a source of records for forms, reports, and data access pages. There are several types of queries in Microsoft Access.

5.1 Select queries

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

5.2 Parameter queries

A parameter query is a query that when run displays its own dialog box prompting you for information, such as criteria for retrieving records or a value you want to insert in a field. 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.

5.3 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 down the left side of the datasheet and another across the top.

5.4 Action queries

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

1 Delete Queries

A delete query deletes a group of records from one or more tables. For example, you could use a delete query to remove students that have discontinued or for which there are no orders. With delete queries, you always delete entire records, not just selected fields within records.

1 Update Queries

An update query makes global changes to a group of records in one or more tables. For example, you can raise marks by 10 percent for all students, or you can raise seats by 5 percent of the existing seats for the Students within a category. With an update query, you can change data in existing tables.

1 Append Queries

An append query adds a group of records from one or more tables to the end of one or more tables. For example, suppose that you get information about some new admissions and a database containing a table of information on those students. To avoid typing all this information into your own database, you'd like to append it to your Students table.

1 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.

5.5 Creating a Simple Select Query using Wizard.

- 1. Click on the object Queries in the object pane
- 2. Select the Design Veiw option from New Query Dialog Box

\leq	😭 Qoen 🔛 Desig	'n	how Table	
	Objects Object		how Table Tables Queries Both Course Department Faculty Students	Add Close
	Groups			

Figure 5.1 Object Pane

Figure 5.2 Add Table dialog box

- 3. The Show table dialog box appears.
- 4. Select the Table for which you you want to create the query (E.g. Course) click on add button. Close.
- 5. Drag the fields Course_id and Course_name and apply the sorting as Ascending by Course_id

	Cou	irse			
	* Cou Cou	rse_id rse_name			
		rse_ree		<u> </u>	
	Field:	Cource pama	•	Course id	
	ĩable:	Course		Course	
	Sort			Ascending	
V	Shaw: Critoria		-{		
	or:		X		

Figure 5.3 Query in Design Veiw

	Course_name	Course_Id
▲	3.C.A 🗾 🔽	12
	OBJECT OR	13
	M.S.c	14
	M.C.A	15
	BASIC	16
	OPERATING	17
	LANGUAGE:	18
	P.G.D.C.A	19
*		

 Table 5.1 Lookup wizard list in DataSheet View

5.6 Passing paramaters to the query

You can even give Criteria for the given query (These criteria will become paramaters for the simple select Query and will convert the query into a parameterised query.

Steps for passing parameters (Use of Or operator)

- 1. You can create a new query by following the steps (1-4) or
- 2. You can make changes to the existing select queries
- 3. In the query the given criteria specifies that the Course_id of only those records will be displayed whose Course_name is "p.g.d.c.a" or "m.c.a" with their course name.

The sorting is done on the bases of Course_id.

<	* Cou Cou Cou	urse			
	Field: Table:	Course_name		Course_id Course	
	Sort Show: Criteria:	"P.g.d.c.a")"m.c.a"	>	Ascending	

Figure 5.4 Query in Design Veiw

Result

	Course_name	Course_Id
	M.C.A 💽	15
	P.G.D.C.A	19
*		

Table 5.2 Select Query (or operator)

5.7 Use of AND operator

According to the query the courses whose duration is "3year" and fees is more than "400000" will be displayed with rest of the fields as all the **Show All Check boxes** are ticked marked.

Field:	Course_name	Course_id	Course Duration	Course_fee
Table:	Course	Course	Course	Course
Sort:		Ascending	Ascending	
Show:				
Criteria:			"3 year"	>400000
or:				
		1/		
	<			
		Figure 5.5 C	Juery in Design Veiw	,
	Result:			
		and Annual I	Dames Duration	E.c.
	Course_n	ame Course Id	Vourse Duration	ree
			15 0.1	500000
	MNC.A	•	15 3 Year	500000

 Table 5.3 Select Query (And operator)

According to the query the courses whose duration is"3year" and fees is more than equal to "400000" will be displayed with rest of the fields as all the Show All Check boxes are ticked marked.

Field:	Course_name	-	Course_id	Course Duration	Course_fee
Table:	Course		Course	Course	Course
Sort:			Ascending	Ascending	
Show:			\mathbf{V}	V	
Criteria:				"3 year"	>=400000
or:					

Figure 5.6 Query in Design Veiw

Result:

		Course_name	Course_ld	Course Duratior	Fee
)	3.C.A 🔄	12	3 Year	400000
		M.C.A	15	3 Year	500000
ſ	Ψ				

Table 5.3.1 Select Query (And operator)

5.8 Creating Query Using Wizard

- 1 Click on the object Queries in the object pane
- 2 Select the Simple Query Wizard option from New Query Dialog B ox
- 3. Select the table for which you want to create Query from Tables/ Quries List Box.
- 4 Choose the required feilds
- 5 Click on the Next Button

Simple Query Wizard	
	Which fixids do you want in your query?
	You can choose from more than one table or query.
	I
<u>A</u> vailable Fields:	Selected Fields:
Faculty_name Department_id	Eaculty_id Department_Headed
	<u>>></u>
	<
	<<
Ca	ancel < Back Next > Finish

Figure 5.7 Simple Query Wizard



Figure 5.8 Simple Query Wizard

- 6 Give the appropriate name to your query
- 7 Click on Finish button

	Faculty_id	Department_Headed
	265	Geography
	121	Computers
	134	History
	165	English
	167	Economics
	185	Maths
	189	Science
Ψ		

Result:

Table 5.4Query Wizard Result

5.9 Passing Parameters to the at query at the runtime

1 Click on the object Queries in the object pane

2 Select the Design Veiw option from New Query Dialog Box .

nput : S	elect Query				
6					
Stud	lents				
*	~				
Stude	ntID				
cours	e_id				
FirstN	Jame				
LastN	lame 🔽				
Field:	StudentID	course_id	StudentID	FirstName	LastName
Field: Table:	5tudentID 5tudents	course_id Students	StudentID Students	FirstNarae Students	LastName Students
Field: Table: Sort:	5tudentID 5tudents	✓ course id Students	StudentID Students	FirstNarae Students	LastName Students
Field: Table: Sort: Show:	5tudentID 5tudents 🔽	course id Students	StudentID Students	FirstNarue Studiants	LastName Students
Field: Table: Sort: Show: iriteria:	StudentID Students	course_id Students	StudentID Students	FirstNarae Students	LastName Students
Field: Table: Sort: Show: Triteria: or:	StudentID Students	course_id Students [course_id]	StudentID Students	FirstNariae Students	LastName Students
Field: Table: Sort: Show: Triteria: or:	StudentID Students	course_id Students [course_id]	StudentID Students	FirstName Students	LastName Students

Figure 5.9 Designing Query with Parameters

- 3. Select the table for which you want to create Query from.
- **4.** After entering the feilds to be displayed in the query result and setting the criteria.
- 5. Select **Parameters** option from the **Query Menu Enter** [course_id] in **Parameter** column and select the datatype as Text.

Parameter	Data Type	^
[course_id]	Text	
		_
	8	
		~

Figure 5.10

6.Click on Ok.

7 Save the query and then run i t.

8 Enter the parameter value as (12).

The result will display all the records having Course_id as 12, with the selected feilds.

Enter A	Parameter Va	Vue	>
course_	id		
12			
F	ок	Cancel	

Figure 5.11 Entering Query Parameters

Ē	input : Select C	luery			
	Student ID	course_id	Student !D	First Name	Last Name
►	123	12	123	Anu	Sharma
	124	12	124	Rahul	Jain
	128	12	128	Angali	Sharma
*					



5.10 Using Calculated fields in the Query

A query **can** be used for calculating values for one of the columns of the table.

5.11 Query Linked Tables

One of the best things about the queries is that you can view feilds from releated tables together .The process for selecting fields for a multi table query is the S same as that for single table query.

Cour Cour Cour	r se_id 🔺 rse_name	1	ParentsName	e 🔨	
	rse Durati rse_fee Enroll		Address PhoneNumbe EmailAddress feespaid		7
Field: Table:	Course_fee		feespaid		feespending: [cour
Sort: Show: Criteria:					

Figure 5.12 Designing Calculated Query For ` Linked Tables

In the above example two tables are linked to from a calculated query.

Course_fee from the course table and reespaid from the students table are used to find out the pending fees.

Formula: Pending Fees: [Course_fees]-[feespaid].

Pending fces is the heading for the column containing the result of the query.

5.11 Creating Cross Tab Query

- 1 Click on the object Queries in the object pane
- 2 Select the CrossTab Query Wizard option from New Query Dialog B ox
- 3 Select the table on which you want to create a Cross Tab Query next.
- 4 Select the feild which we you want to use as row heading (Course_id)and click on Next.

CI	osstab Query Wizard	
W fie re To ta fie	hich table or query contains the slds you want for the crosstab query sults? o include fields from more than one ble, create a query containing all the slds you need and then use this uery to make the crosstab or erv	Table: Course Table: Department Table: Faculty Table: Students
ų	iery to make the crosscab query.	View Tables C Queries C Both
	Sample:	Heade: 1 Hezder2 Header3
-		Cancal < Back Next > Finish
	Figure 5.13 Cro	ossTab Query Wizard(Step 1)
	Which fields' values do you want as row headings?	Available Fields: Selected Fields:
	You can select up to three fields. Select fields in the order you want information sorted. For example, you could sort and group values by Country and then Region.	FirstName LastName Department_name ParentsNames Address PhoneNumber EmailAddress
	You car, select up to three fields. Select fields in the order you want information sorts d. For example, you could sort and group values by Country and then Region.	FirstName LastName Department_name ParentsNames Address PhoneNumber EmailAddress EmailAddress Course_id Header1 Header2 Header3 course_id2 course_id3 course_id4

Figure 5.14 CrossTab Query Wizard(Step 2)

- Select the feild which you want to use as column heading. (FirstName _id) and click on Next.
- 6. Select the Count function and click on Next.
- 5. Give the required name to the query and click on Finish

Ē	Students_Cros	stab : Crosstab Qu	uery							
	course_id	Total Of Studen	Abhishek	Angali	Ankit	Anu	Kirti	Mili	Rahul	Reha
•	12	3		1		1			1	
	13	1			1					
	15	1						1		
	16	1					1			
	18	2	1							

Result:



The query result shows that how many students are enrolled for a particular course with their first name.

5.12 Finding Duplicate Values

- 1 Click on the object Queries in the object pane.
- 2 Select the Finding Duplicate Query Wizard option from New Query Dialog B ox.
- 3. Select the table for which you want to find duplicate values. For example (Student Fig. 5.17).
- 4. Select the feilds from the table (Course_id,Firstname,Lastname. Fig. 5.18).
- 5. Click on the Next Button

KARN HARM HARM KANN KANN HARM KANN KANNN KANN KANNN KANNN KANNNN KANNNNNNNNNN	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: Course Table: Department Table: Faculty Table: Students
	View © Iables © Queries © Both Cancel < Back Next >

Figure 5.17 Find Duplicate Query Wizard (Step 1)

I NAM NAM NAM 1 NAM NAM NAM 2 NAM NAM NAM 3 NAM NAM NAM 4 NAM NAM NAM	uery Wizard Which fields might contain duplicate For example, if you are looking for o would choose City and Region fields Available fields: StudentID FirstName	information? ities with more than one customer, you here. Duplicate-value fields:
	LastName Department_name ParentsNames Address PhoneNumber EmailAddress	>> <<
	Cancei	< Back Next > Einich

Figure 5.18 Find Duplicate Query Wizard (Step 2)

	Do you want the query to For example, if you chose CustomerName and Addre	show fields in addition to those to look for duplicate City value iss here.	with duplicate values?
4 XX.' XXX XXX	Available fields:	Additional	query fields:
	Pepartment_name ParentsNames Address PhoneNumber EnuailAddress	StudentID FirstName	
	Cancel	< <u>B</u> ack <u>N</u> ext	> <u>F</u> inish

Figure 5.19 Find Duplicate Query Wizard (Step 3)

Result:

	course_id	Student ID	First Name	Last Name
►	12	128	Angali	Sharama
	12	124	Rahul	Jain
	12	123	Anu	Sharma
	18	129	Abhishek	Joshi
	18	127	Reha	Khan

Table 5.7 Finding Duplicate Value Query

The records which have same value in the course_id column are displayed with the desired feild.

5.13 Finding Unmatched Data

- 1 Click on the object Queries in the object pane.
- 2 Select the Finding Unmatched Query Wizard option from New Query Dialog B ox.
- 3. Select the table from with which you want to compare another table for finding unmatching data. (Faculty)

e or query contains records you want in the query results? purse epartmant
oldents
s C Queries C Both

Figure 5.20 Find Unmatched Query Wizard (Step 1)

- 4. Click on Next
- 5. Choose another table with which you want to compare the previously chosen table.(Department)
- 6. Fig 5.22 shows the feild on the basis of which missing values will be shown.
- 7. Click on Next button.
- 8. Select the feilds from the Faculty table which we want in the query result.

ind Unmatched Que	ry Wizard
	Which table or query contains the related records?
1 XXX XXX 2 3 4 4 XXX XXX 4 XXX XXX	For example, if you've already selected customers and you're looking for customers without orders, you would choose orders here.
	Table: Course Table: Department Table: Students
	View
	Cancel < Sack Next > Finish

Figure 5.21 Find Unmatched Query Wizard (Step 2)

ir.	nd Unmatched Que	y Wizard		\setminus	
	CIN HER CIN HER CIN HER CIN HER CIN HER CIN HER	What piece of inform For example, a Cust CustomertD field. M Select the matching Fields in 'Saculty' : Faculty_id Faculty_name Department_Head Department_id	nation is in both tables :omers and an Orders I atching fields may hav field in ear!1 table and	? table may both ha e different names then click the <= Fields in 'Departr Faculty_id Department_re Department_id	ve a , > button. ment' : me
		Matching fields:	Department_Headed	<=> Department	_name
		Cancel	< <u>B</u> ack	<u>N</u> ext >	Einish

Figure 5.22 Find Unmatched Query Wizard (Step 3)

- 9 Click on Next.

	wery wizard What fields do you want to see in t	he query results?
1 MAR MAN 2 MAR MAN 3 MAR MAN 3 MAR MAN	Available fields: Department_id	Selected fields: Faculty_id Faculty_name Department_Headed <
Figure 5.23	Cancel <br Find Unmaichea Qi	Bark Next > Einish wery Wizard (Step 4)



`Figure 5.24 Find Unmatched Query Wizard (Step 5)

Result:

Missing_data_department : Select Query					
	Faculty_id	Faculty_name	Department_Headed		
•	055	Nitesh	Geography		
	167	Kajal	Economics		
Ψ					

Table 5.8 Finding Unmatched Value Query

The query result shows the data which is present in the faculty table but is not present in the department table.

5.14 Action Queries.

An action query is a query that makes changes to or moves many records in just one operation. There are four types of action queries: delete, update, append, and make-table.

Create an Append Query

An append query adds a group of records from one or more tables to the end of one or more tables.

- 1. Create a query to extract the records you want to append to another table.
- 2. In query design view, click the arrow next to query type on the toolbar, and click append query.
- 3. In the table name box, enter the name of the table you want to append records to.



Figure 5.24 Types of Action Queries

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- 4. Do one of the following:
 - If the above table is in the current database, click another database and type the path of the database where the table is stored or click Browse to locate the database.
 - Click OK
 - Drag from the field list to the query design grid the fields you want to append and any fields you want to use for setting criteria.
 - If you have a field with an auto number data type, do one of the following:
 - Add Auto number values automatically
 - To add auto number values automatically, don't drag the auto number field to the query design grid when you create the query.
 - Keep the auto number values from the original table.
 - To keep the auto Number values from the original table, drag its AutoNumber field to the query design grid when you create th e query.
 - If the fields you've selected have the same name in both tables, MS-Access automatically fills the matching name in the Append To row .If the fields in the two tables don't have the same name, in the Append To row, enter the names of the fields in the table your appending to.
 - In the criteria cell for the fields that you have dragged to the grid, type the criteria on which additions will be made.
 - To preview the records that the Query will append, click view on the toolbar.
- 5 To return to query view, click View the toolbar again.
- 6 Clock run on the toolbar to add the records.

7 To confirm before appending the records, MS-access displays the confirmation message. Click

Create an Update query

An update query makes global changes to a group of records in one more tables.

- 1. Create a query with the tables or queries that include the records you want to update.
- 2. In query Design view, click the arrow next to query type on the toolbar, and click update query.
- 3. Drag from the field list to the query design grid the fields you want to update or you want specify criteria for.
- 4. In the criteria cell, specify the criteria if necessary
- 5. In the update to cell, for the fields you want to update type the expression or value you want to use to change the fields, as shown in the figure
- 6. To preview a list of the records that will be updated, click view on the toolbar. This list won't show the new values. To return to query design view, click view
- 7. Click run on the toolbar to update the records
- 8. The new update query is now saved and appears in the database window with an icon update Create a **delete query** that contains only one table

A delete Query deletes a group of records from one or more tables.

- 1. Create a query with only one table from which you want to delete records
- 2. In query design view, click the arrow next to query type on the toolbar, and click delete query
- 3. Drag the asterisk (*) from the field list for the table to the query design grid.

To specify criteria for deleting records, drag to the design grid the fields on which you want to set criteria. Where appears in the delete cell under this field. In the criteria cell for the fields that you have dragged to the grid, type the criteria.

To preview the records in a design view that will be deleted, click view on the toolbar. To return to query design view, click view.

Click Run on the toolbar to delete the records.

The new update query is now saved and appears in the database window with an icon delete.

5.15 Filters

While sorting the information in the datasheet view filter allows you to apply your own ordering to display the data of records in the records of the table.

- Filter by Selection Tool
- Filter by Form Tool
- Apply filter\Remove filter

To use Filter by selection

The simplest way of filtering the display of records in a table is use

Filter by **Selection**. This displays only records that have the same value in that field.

- 1. Display the table in datasheet view.
- 2. Select the value in a particular field that you have chosen as the filter value.
- 3. Select Course_id (12) from the Student table.
- 4. On the Standard Toolbar, click filter by selection.

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01111 0	

Students : Table						
Student ID	course_id	First Name	Last Name	Department_r		
123	12	Anu	Sharma	Computers		
124	12	Rahul	Jain	Computers		
125	15	Mili	Mehera	Computers		
126	16	Kirti	Joshi	Computers		
127	18	Reha	Khan	Computers		
128	12	Angali	Sharma	Computers		
129	18	Abhishek	Joshi	Computers		
130	13	Ankit	ial	Computers		

Table 5.9 Student table in Datasheet View

5. From the Records Menu, select Filter, then select Filter by Selection.

•	123	12	Anu	Sharma	Computers
	124	12	Rahul	Jain	Computers
	128	12	Angali	Sharma	Computers
*					

Table 5.10 Filter by Simple Selectiom

The datasheet is refreshed to display only records that pass the selected filter criteria- You should always get at least one record- the one that you selected for the filter.

You may further limit the records that are displayed by adding to the filter by selection.

	Student ID	course_id	First Name	Last Name	Department_na
	123	12	Anu	Sharma	Computers
	128	12	Angali	Sharma	Computers
*					

Table 5.11 Filter by Multiple Selection

If you select part of a field, then the filter will be based on that partial selection. For example if you pick second character "n" of a field and filter by this then the results will be exactly that-fields that have an "n" in the third Second position field of that field.

Filter by Form

If you want to find records that match a value in just one field, **Filter by Form** shows you a blank record where you can either enter a value you want to find or choose it from a drop down list.

Let us filter data of students who have enrolled for the course_id 18.

- 1. Open a table, query, or from in datasheet view or open a form view .
- 2. From the toolbar, click on Filter by Form icon to switch to Filter by Form Window
- 3. Click the field in which you want to specify the criteria that records must meet to be included in the Filtered set of records marks.

	Student ID	course_id	First Name	Last Name	Department_nar F
		"18"			
		12	\bigvee		
	$ \land \land$	13	\checkmark		
		15			
-	\sim \land	16			
	//	18			

Figure 5.25 Selecting Value for Filtering Data

- 4 Enter your criteria by selecting the value you are searching for from the list in the field(if the list includes field values), or by typing the value into the field(Course_id 18)
- 5 Click Apply Filter on the toolbar or Records>Apply Filter. Click on the Remove Filter icon in the toolbar to view all the records.

Result:

ⅲ	I Students : Table						
	Student ID	course_id	First Name	Last Name	Department_nar F		
•	127	18	Reha	Khan	Computers		
	129	18	Abhishek	Joshi	Computers		

Table 5.12 Filter by Form

Filter by form Using OR Filter

An OR Filter looks for records that match one condition or another. For example, let us retrieve records of students who have the course_id as 15 or have LastName "Sharma".

Filter by form for one condition or another,

- 1. Open Students table.
- 2. Choose Course_id 18 from drop down list of course_id field.
- 3. Click on the **OR** tab at the bottom of the Filter by From window. You will see another form.

4. Select Sharma from the drop list of LastName



E Students : Table							
	Student ID	courseid	First Name	Last Name	Department_n		
)	123	12	Anu	Sharma	Computers		
	128	12	Angali	Sharma	Computers		

Table 5.13 OR Filter

Filter for Input using Complex Expression

To filter records from the students table where Course_id = 15 and Student_id = 125

1. Open the student table and right click inside the StudentIid field.

2. The menu appears and in the filter for box, type 15 and [Student_id] = 125



Figure 5.26 Seting Parameters for Filtering

3. Press Enter to apply the filter.

E	Enter Rarameter Value 🛛 🛛					
	Student	_id				
Ţ	125					
		ОК	Cancel			

Figure 5.27 Entering Parameters

Result:

III Students : Table							
	Student ID	course_id	First Name	Last Name	Department_nar F		
•	125	15	Mili	Mehera	Computers		
*							

Table 5.15 Input Filter

Advanced Filter using OR/AND

An advance filter lets you combine conditions and fields freely for a filter. To create an advance filter or sort you have to open a filter editing window.

- 1. Open the datasheet or Form view you want to filter.
- 2. From the menu bar, Choose records>Filter>advance filter\sort.
- 3. A grid appears at the bottom half of the window. Drag a field name from the field list into the grid or type the name of the field or choose the name from the drop down list on the grid.
- 4. Now enter the value in the criteria row for the field.
- 5. For an OR filter you enter an additional condition in the OR row for whatever field it applies to.
- 6. For an and filter you enter an additional conditions in the criteria row for whatever field it applies to.
- 7. Click on records > Apply filter to see the filtered records.

5.16 Removing a Filter or Saving it

To remove a filter, click on Remove Filter on the toolbar.

You cannot save the filter as a separate object in the database but you can save the changes when you close the datasheet view.

MS-Access will remember the last filter you applied .Next time you open The same table, you can click on apply Filter to see the same, filtered records

5.17 Similarity between select queries and filters

- ¹ Both retrieve a subset of records from an underlying table or query.
- ¹ Produce results that can be used as the source of data for a form or report.
- ¹ Can sort records.

In general, enable you to edit data if editing is otherwise allowed. (You can also perform bulk updates with an update query.)

How you want to use the records that are returned determines whether you use a filter or a query.

Generally, use a filter to temporarily view or edit a subset of records while you're in a form or datasheet. Use a query if you want to do any or all of the following:

- ¹ View the subset of records without first opening a specific table or form.
- ¹ Choose the tables containing the records you want to work with and add more tables at a later date if necessary.
- ¹ Control which fields from the subset of records display in the results.
- ¹ Perform calculations on values in fields.

Note :

Even if you determine you need a query, consider taking advantage of the easy Filter By Form, Filter By Selection, or Filter For Input techniques for creating a filter, and then saving the filter as a query. This enables you to bypass the query's design grid altogether (unless you want to make additional changes to the query). Even so, when you open the query in Design view, you'll see how Microsoft Access filled in the design grid using the information from the filter. You can then use this information as a guide for making additional changes.

Self Assessment Questions

- 1. Define Queries and Filters and mention the similarities between them.
- 2. Define different types of Queries with example.
- 3. Explain three different types of filters in detail.




More Database Objects

Objective :

- u Disussing the different methods of creating interactive data objects
- u Explaning the uses of controls and their application

Contents

- 6.1 Creating Forms
- 6.2 Creating Chart Using Chart Wizard
- 6.3 Creating Fivot Table
- 6.4 Creating Pivot Chart
- 6.5 Modififying thr form in design view.
- 6.6 Form Templates
- 6.7 The Label Wizard
- 6.8 Including Calculated Feild in a Form
- 6.9 Creating Macro
- 6.10 Generating Report
- 6.11 Adding Command Button
- 6.12 Generating Summary Report

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

You can create a form quickly by using the AutoForm command or a wizard. AutoForm creates a form that displays all fields and records in the underlying table or query. A wizard asks you questions and creates a form based on your answers. You can then customize the form the way you want it in Design view (Design view: A window that shows the design of these database objects: tables, queries, forms, reports, macros, and data access pages. In Design view, you can create new database objects and modify the design of existing ones.).

6.1 Creating Forms

- 1. In the database window, click Forms Objects.
- 2. Click the button New icon on the database window toolbar.
- 3. In the New Form dialog box, click any one of the following:
 - Design Veiw
 - Form Wizard
 - AutoForm: Columnar.
 - Autoform: Tabular
 - AutoForm: Datasheet:
 - Autoform: Pivottable
 - Autoform: Pivotchart:
 - Chart Wizard
 - Pivot Table Wizard

Click the name of the **table or other record** source that includes the data you want to base your form on.

Select the fields to be include in a form

Click Next button.

Form Wizard	
	Which fields do you want on your form? You can choose from more than one table or query.
Tables/Queries	
Table: Department	<u>•</u>
<u>A</u> vailable Fields:	Selected Fields:
	Faculty_id Department_name Department_id <
	Cancel < Back Next > Finish
	(Step1)
Form Wizara	
What lay, out v.ould y	ou like for your form?
	Cancel < <u>B</u> ack <u>N</u> ext > <u>F</u> inish

Figure 6.2 Form Wizard(Step2)





Figure 6.4Form Wizard(Step4)

Give the **title heading**, that you want to appear on the forms title bar Click **Finish** button



Figure 6.6 Tabular AutoForm

	Faculty_id	Faculty_name	Department_Headed	Department_id
►	055	Nitesh	Geography	035
	121	Kumar Sanu	Computers	045
	134	Rohan	History	034
	165	Ria Sethi	English	012
	167	Kajal	Economics	064
	185	harish	Maths	065
	189	Seema	Science	061
42				

Figure 6.7 Datasheet AutoForm

The AutoForm Columar Tabular, Datasheet can also be created directly from the the New Form dialog box. In this case you have choose the table for which you want to create a form from the dropdown menu of all Queries and tables.

New Form	
This wizard creates a form with a chart.	Design View Form Wizard AutoForm: Columnar AutoForm: Tabular AutoForm: Datasheet AutoForm: PivotTable AutoForm: PivotChart Chart Vizard Pivotifable Wizard
Choose the table or query where the object's data comes here:	Students
	Missing_data_department No_of_Students_enroll_course No_students_course Students

Figure 6.8 New Form Dialog Box

6.2 Creating a Chart Using Chart Wizard

Charts are the graphical representation of the data.

They are one of the most important tools used for analysing data for making comprative study about the different things.

Steps to create a Chart

- 1 Click the Chart Wizard option from the New Form dialog box.
- 2 Select the name of the table or query(here Students table) for which you want to create a chart.

Chart Wizard			
	Which fields contain the data yes Available Fields: StudentID FirstName LastName Department_name ParentsNames Address PhoneNumber EmailAddress	ou want for the chart? Fields for Chart:	
	Cancel	< <u>B</u> ack <u>N</u> ext >	_0_

Figure 6.9ChartWizard(Step1)

3 Select the required feilds and click on Next Button.

Chart W				What type of chart would you like? Choose a chart that will appropriately
ada!				display the fields you have selected. Pie Chart
				A pie chart shows the relationship or proportions of parts to the whole. It always contains only one data series, which makes it useful for emphasizing a significant element.
			0	
		Ca	ancel	< Back Next >

Figure 6.10 Chart Wizard(Step2)

Chart Wizard	
Preview Chart course_id Data Cancel <	How do you want to lay out the data in your chart? You can drag and drop field buttons to the sample chart. Double-click a number or date field in the chart to change how the chart will summarize or group data. course_id

Figure 6.11 Chart Wizard(Step3)

- 4 Choose the type of chart you want to create.
- 5 Drag the feild(course_id) on data click on the Next button
- 6 Give the chart the title of your choice and click on Finish
- 7 Double click on the chart Datasheet will appear



Figure 6.12 Chart Wizard(Step4)

8 Right click on the white space a pop up menu will appera, from the pop up menu choose Chart options.

Chart Options Titles Legend Data Labels	? 🛛
Label Contains Series name Category name Value Percentage Bubble size Separator:	Stedeats
0	OK Cancel

Figure 6.13 Chari Options Dialog BoxS

9 From the Chart Options dallog box, select Data Labels tab

10 Select the value check box.

11 Click on Ok.



Figure 6.14 Chart

12 The datalables which appear shows the number of students enrolled for a course.

6.3 Creating Pivot Table

- **1** Select the Pivot Table option from the New Form Dialog Box and select the table students from the droplist and click on Ok.
- 2 The following window will appear.



Figure 6.15 Pivot Table Desigening

- **3 Drop** the first name in column feilds ,drop course_id in the in row feild from the list of feilds.
- 4 Select Course_id from the feild list, at the bottom of the feild list box from the drop down menu, choose Data Area and click on Add To button.
- 5 The table shows you the total number of students enrolled for a particular course

Dron Filter	r Fio	Ide	Horo							/	1
Diopiniter		FirstName •									
	Ĩ		Angali	Ankit	Anu	Kirti	Mili	Rahul	Reha	Grand Total	
course id	1 - 3	e_id	Count of course_i	Count of course_ic	Count of course_id	Count of course_ic	Count of course_id	Count of course_id	Count of course_id	Count of cours	se_
(Blank)	+	_)							_
12	+				1			1			
13	+			1							
15	-						1				
10	-+	1				1			1	- 1	
Grand Tota	- al +	1) 1	1	1	1	1	1		

Figure 6.16 Pivot Table

6.4 Creating Pivot Chart

- **1** Select the Pivot Chart option from the new form dialog box.
- 2 Choose the Students table.
- 3 Drag the Course_id feild for the Title Axis and Student_id feild for the Data feilds
- 4 The chart is formed
- 5 Select the Axis Title text box and right click on it, choose the properties option.
- 6 Properties dialog box as in the (Figure 6.17) appears.
- 7 Customize the chart using the different options present in the box.(E.g in place of Axis Title give the caption Student_id).

6.5 Creating the Form in Design View

To modify the design of a form, switch to design view

- 1. In the database window, click under objects.
- 2. Click on Design button in database window toolbar. If you are in form view, click the view button on the toolbar and select Design View.

Design view comprises of three other windows that may appear on screen: the property sheet, the field list and the toolbox window. Choose the required controls and design a form of your choice. You determine where information appears in every section by placing different controls. The controls are objects on a form, report, or data access page that display data, perform actions, or are used for decoration. MS Access includes the following types of controls, which are all accessible through the toolbox in design view of a form, report, or data access page:

A **Label** can be attached to another control. When you create a text box for example, it has an attached label that displays a caption for that text box. This label appears as a column heading in the datasheet view of a form

You use **Text Boxes** on a form, report, or data access page to display data from a record source. The type of text box is called a bound text box because it's bound to data in a field.



Figure 6.17 Pivot Chart



Figure 6.18 Tool Box

The list in a **List Box** consists of rows of data. In a form, a list box can have one or more a columns, which can appear with or without headings.

A **Combo Box** is like a text box and a list box combined, so it require less room. You can type new values in it, as well as select values from a list.

A **Drop-down List** box is similar to a combo box but a drop-down list box shows only one record until you click to expand the contents; however, you can't type new values in a drop-down list box.

Command Buttons provide you with a way of performing action by simply clicking them.

You can use a **Check Box** on a form, report, or data access page as a standalone control to display a yes\no value from an underlying table, query, or sql statement

You can use an **Option Button** on a form, report or data access page as a stand alone control to display a yes\no value from an underlying record source. If the option button is selected, the value is yes, if not, the value is no.



Figure 6.19 Contorls on Form in Design View

You can use a **Toggle Button** on a form as a stand-alone control to display a yes\no value from an understanding record source. When the button is pressed in, the value in, the value is yes . when the button isn't pressed in, the value is no.

You can use a **tab control** to present several pages of information as a single set. This is especially useful when you're working with many controls that can be stored in two or more categories.

To draw a **Rectangle**, click rectangle toolbox and then click anywhere on the form to create a default-sized rectangle.

A **Form Tab Control** is the easiest and most effective way to create a multiple -page form. With a tab control to switch pages, you click one of the tabs.

The **Page Break Control** is used to mark a horizontal oreak between controls on a form .A page break between controls on a form. A page break is active in Form view only when the defaultView onlywhen the Default View property of the form is set to single form.

A **Subform** is a form within a form. The primary form is called the main form ,and the form within the form is called the SubForm .

A Form/Subform combination is often referred to as a hierarchical form, a master/detail form or pearent child form.Subforms are especially effective when you want to show data from tables or quries with many relationship.

6.6 Form Templates

Microsoft Access uses a template to define the default characteristics of the form or report. The template also contains all the default property settings for the form or report and its section from header, from footer, detail and controls.

The default templates for forms and reports are called normal

Select tools menu and click on options.

Click on Forms or reports tab .

In the box under form template enter the name of the form you want to save as a template

Note: Changing the template does not have any effect on existing forms or reports.

- 1 A template does not create controls on a new form or report
- 2 Microsoft Access saves the settings for the Template and Report template options in your microsoft access workgroup information file, not in your user database(the.mbd fie). When you change an option setting, the change applies to any database you open or create. To see the name of the template that is currently used for new forms or reports, click options on the Tools menu, and then click the Forms\Reports tab.
- 3 To use your templates in other database, copy or export the templates to them. if your templates are not in a database, Microsoft Access uses the normal templates for any new forms and reports you create. However, the names of your templets appear in the Form template and Report template options in every database in your database system, even if the templates are not in every database.

6.7 The Label Wizard

The Label Wizard creates report designs that can used to print every labels. You can use the labels that match the every number, or create your own custom made labels.

- 1. In the database window, select Reports and click new.
- 2. Choose a Table or a Query whose data must be used for the labels.
- 3. Double click the Label Wizard.
- 4. In the first step, this wizard prompts you to choose the type of every label (label size) you want to print. Click on next
- 5. Select the font name, font size and color for the labels. Click Next.
- 6. Design the label prototype by selecting the fields to be included in the label .after including on the field, press enter to go to the next line. You can include text matter also like c\o etc. click on Next.
- 7. Select the field that labels must be sorted on. For example, to print labels city wise, select the field city. Click on next.
- 8. Type a name for the label design and click on Finish.

Creating your own label formats:

- 1. In the database window, select Reports and click New.
- 2. Choose a table or a Query whose data must be used for the labels.
- 3. Double click the label wizard.
- 4. In the first step, this wizard prompts you to choose the type of every label (label size) you want to print or Customize.
 - Enter the measurements.
 - Enter the name for the label
 - Click OK and click Close.
 - Click Next to go ahead.

6.8 Including Calculated Feilds in the Forms

- 1. Create a new database Students_Results
- 2. In it create table Class X with the following Feilds
- 3. After saving the table open the table in the Form Tabular View.

	Class X : Table	
	Field Name	Data Type
₩	Roll No	Text
	Names	Text
	English	Number
	Hindi	Number
	Sanskrit	Number
	Science	Number
	Social	Number
	Total	Number
	Percentage	Number

Table 6.1 Subjects Table

🗲 Form Header			
Boll No Names	English Hin	di inskrit cience. Soci	al Total Percentage
🗲 Detail			
Roll No Names	English Hindi	Sanskri Science Socia	I Total Percentage
Earm Eachar			

Figure 6.20 Form in Design View

- 4 Now select **Total text box** and right click on it. Choose the **prop**erties option. The following dialog box appears.
- 5 Chose Data tab in the Control Source.

Total				-		
Format	Data	Event	Other	.41	1	
Control :	Source .		=([er	Nish]+{	indi]+[sa	<u> </u>
Default '	Value	 				
Validatio	n Rule 🗸					
Validatio	n Text .					
Enabled			Yes			
Locked .			. No			
	alum		Datat	ace Defa	ault-	

Figure 6.21 Properties Dialog Box.

5 Chose Control **Data** tab under the Source property write the following formula :

=([English]+[hindi]+[sanskrit]+[maths]+[science]+[social])

- 6 Now select **Percentage text box** and right click on it .Chose the **proporities** option.
- 7 Chose **Data** tab under the Control Source property write the following formula =([total]*100/500]
- **Note :** The formula starts with an "=" sign and end on the following "("or closing round brackets.

- Unit 6
 - **Note :** Enter marks for any one subject Hindi or sanskrit. The subject for which you are not entering marks enter the value as 0.

6.9 Create a Macro to Check that the marks entered are not more then 100 in any of the subjects

- 1. In the Form Design Veiw select the text box of subject hindi. Right click on it .
- 2. Select the properities option.Under Event tab click on

Before Update text box. and then click on (.....) button.



Figure 6.22 Choose Builder Dialog Box

- 3. Choose the Macro Builder option
- 4 The Macro Builder window appears. It prompts you to name it give it the name (Hindi)
- 5 Select condition option from the View Menu.
- 6 Add the following condition. [hindi]>100 and in then type a appropriate message.
- Note: Macro for all the subjects can be created in the similar manner.



Figure 6.23 Creating Macro Condition

6.10 Generating Report

- 1 Select the Report option from the object pane.
- 2 Click on the New option and Select the report Wizard Option.
- 3 Select the table for which you want to generate the report.
- 4 Select the feilds for which you want to add to the report.
- 5 Click on the Next button

Report Wizard	
	Which fields do you want on your report? You can choose from more than one table or query.
Tables/Queries Table: Class X	
<u>A</u> vailable Fields.	Selected Fieids:
	English Hindi Sanskrit Maths Science Social Cocial Total Par-integic
Car	nce' < Back Next > Finish

Figure 6.24 Report Wizard(Step1).

- 6 If you want to add any grouping levels select it or click Next.
- 7 Select the feilds according to which you want to do sorting.
- 8 Click on Next.
- 9 Choose the Tabular option.
- 10 Click on Next.
- 11 Choose the Corporate Style of Report
- 12 Click on Next.
- 13 Click on Finish.

Report Wizard			
A REAL REAL REAL REAL REAL REAL REAL REA	Ycc as 1 2 3 4	rosr ou can sort records by up to four fi cending or descending order. Percentage Names Roll No	ields, in either Ascending Ascending Ascending Ascending Ascending
	ncei	<a>Back <u>N</u> ext >	<u> </u>

Figure 6.25 Report Wizard(Step2).

Report wil be generated as you click on finish. Button it will not have values of Percentage and total.

For this you open the Report in the Design View.

6.11 Adding Command Buttons to the Form

Command Buttons are used to get some specific function done.

Like in the example we will see that the command button on Form frmclass X is used to directly open the Report Class X

Steps to add a command button

- 1 Open the frmclass X from in the design view.
- 2 From the Control Box select the command button. Make sure that Contral Wizards Button in the toolbox is pressed.
- 3 Click the command button tool in the toolbox.
- 4 In the Form Design Veiw window point to where you want this button to appear and drag the button.

5 Choose the Report Operations from Categories and Print Preview from operations select the report on which you want it to appear.

Command Button Wiza	ard		
Sample:	What action do you want to happ pressed? Different actions are available for <u>Categories:</u> Record Navigation Record Operations Form Operations Report Operations Application Miscellangous	een when the button is r each category. Actions: Mail Report Print Report Print Report Send Report to File	
	Cancel < Back	Next > Einish	

Figure 6.26 Command Button Wizard(Step1).

Sai ple: Previsw Report	Whatereport would you like the command button to preview?
	Cancel < <u>B</u> ack <u>N</u> ext > <u>F</u> inish

Figure 6.27 Command Button Wizard(Step2).

6 In step three you have to two options Text and Graphics.Graphics options help you to get an appropriate picture on the command button according to the operation you have chosen.

De une set her here en the herten?	
Sample: Do you want text or a picture on the button? Preview Report If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display If you choose Text, you can type the text to display. If you choose Picture, you can click Browse to find a picture to display. If you choose Text, you can click Browse to find a picture to display. If you choose Picture, you can click Browse to find a picture to display. If you choose Picture, you can click Browse to find a picture to display. If you choose Picture, you can click Browse to find a picture to display. If you choose Picture, you can click Browse to find a picture to display. If you choose Picture, you can click Browse to find a picture to display. If you choose Picture, you can click Browse to find a picture to display. If you choose Picture, you can click Browse to find a picture, you can click Browse to find a picture, you can cl	э у .
Cancel < Buck Next > Einish	

Figure 6.28 Command Button Wizard(Step3).

7 In the fourth step you are required to give the caption for the button.

Command Button Wiza	ard		
Sample Preview Report	What do you want to name the button? A meaningful name will help you to refer to the button later. PrintPreview That's all the information the wizard needs to create your command button.		
	Disclay Help on customizing the button.		
	Cancel < <u>B</u> ack <u>N</u> ext > <u>Finish</u>		

Figure 6.29 Command Button Wizard(Step4).



Figure 6.30 Command Button on the form in design view

8 When you click on the print preview button in the Forn View the following report should appear.



Figure 6.31 Report

6.12 Generating Summary Report

- 1 **Open** the Student_information Database
- 2 Choose Reports from the object pane.
- 3 From the New Report Dialog Box Choose Autoform: Columar option and choose the Students table.
- 4 Open the Report in the Design Veiw
- 5 Click on the Grouping and Sorting option on the Standard Toolbar

	Field/Expression		Sort Order Ascending	
(i)				
() StudentID			Ascending	
1				
		/		
		1	Group Properties	
Group Header Yes Group Footer No				
G	roup On	Each V	alue Keep group togethe	er on one
Group Interval 1 page?				
K	eep Togather	V Whole	Group	

Figure 6.32 Sorting and Grouping Dialog Box

- 6 Do the grouping on the bases of Course_id and Student_id and apply the same group properties on both the feilds as shown in the (Figure 6.32)
- 7 **Open** the report in the Design View and arrange all the lables and text boxes as shown in the (Figure 6.33)
- 8 Take two lebles and text boxes from the tool box and place them in Course_id header.You may delete the Text boxes and lables of the rest of the feilds which are not required in the report.



Figure 6.33 Report in Design View

- 9 Now right click on the course_id text box and click on properties option.In the Control source property under Data tab select course_id and in the Ranning Sum property select **Over Group**.
- 10 Repeat the same steps for the student_id text box. In the control source write the formula = count(student_id) and in the Running Sum property select No.
- 11 Change the heading for the report.

12 Save the Report and see it in print preview.

The Summary Report shows the total number of students enrolled for the course

You can use the Keep Together property for a Group in a report to keep parts of a group – including the Group Header, Detail Section, and Group Footer-together the same page.

You can use the Group Interval property with the Group on Property to specify how records are grouped in a report. The Group Interval Property specifies an interval value that records are grouped by. This interval differs depending on the data type and Group on Property setting of the field or expression you are grouping on.



Summary Report Showing the number of students enrolled for each course

Figure 6..34 Summarized Report

To Set Group Interval property to a value other than its default setting (1), you must first set the Group Header or Group Footer property or both to yes for the Selected field or expression.

You can use the group on property in a report to specify how to group data in a field or expression by data type.

6.13 Remove a sort or a group from a report

To remove a sort or a group:

- 1. Open the report in Design View
- 2. Click the Sorting\Grouping button on the report design toolbar.
- 3. Click the record selector for the sort or group you want to delete(the gray box to the left of the field is the record selector)
- 4. Press delete and then choose yes.

Self Assessment Questions

- 1. Define different types of forms that can be created.
- 2. What are the benefits of forms
- 3. How do you add a command button to the form
- 4. Define the different tools present in the toolbox.
- 5. What is the advantage of form design view.
- 6. Explain different methods of creating charts.
- 7. What is the purpose of generating reports?
- 8. Define sorting and grouping feature of a report



U n i t

Handling Dtabase Objects

Objective :

u Disscusing the various tools which hepls in working with the database ob jects.

Contents :

- 7.1 Introduction
- 7.2 Displat the list of objects
- 7.3 Viewing Objects Contents
- 7.4 Creating New Object
- 7.5 Hiding an Object
- 7.6 Deleting the Object
- 7.7 Renaming the Object
- 7.8 Copying Object
- 7.9 Adding Description to the object
- 7.10 Creating Toolbar
- 7.11 Creating Shortcut Menu
- 7.12 Analyzing a Database
- 7.13 Startup Option

7.1 Introduction

Programers create different data objects while creating a database but at times are not able to keep tracks of these objects, At such times a programmer can add descriptions to these .For these purpose Ms-Access provides various tools like - Delete, rename, or copy database objects or Show descriptions in the database window.

7.2 Display the list of objects of a given type.

Under Objects, click the corresponding object from the list in the database window.

7.3 Viewing the contents of an object

Simply double-click the name of the object, or click on the object once and then click button. Design View button of in the Database window.

Click the corresponding object in the database window and then click button.

7.4 Creating a new object

Under objects, click the corresponding object from the list in database window, and click button.

- Saving the Design of an object
 - 1. In the design view, select save from file menu, or press CTRL+S or click on save button on the toolbar
 - 2. If necessary, enter the name of the object.
- You can save any changes in the usual way when you close the objects window.
- Point to file and then click save as or Export command, to save the object under a different name, or even in a different database.

7.5 Hiding an object

You can prevent an object from being displayed in the database window

- 1. Select the object to be hidden.
- 2. On the view menu, click properties.
- 3. Activate the hidden option, then click ok

The selected object becomes hidden in the database window.

7.6 Deleting an object

- 1. Close the database object you want to delete. In a multi-user environment, confirm that all users have closed the database object.
- 2. Under objects in the database window, select the type of database object you want to delete.
- 3. Click the object in the object list, and then press delete.

7.7 Rename an object

- 1. Close the database object you want to rename.
- 2. Under objects in the database window, select the object you want to rename.
- 3. Right-click the object, and then click rename.
- 4. Type the new name for the object, and then press enter

7.8 Copy an object

- 1. In the database window under objects, click the type of database object that you want to copy.
- 2. In the object list on the right side of the database window, select the object and then click on copy or cut icon on the toolbar.
- 3. Click Paste icon on the toolbar.

- 4. Type a unique name for the object in the paste as dialog box.
 - Select structure only to paste only the structure of the table
 - Select structure and data only to paste the structure of the table and its data.
 - Select append data to Existing table to append data to an existing table.

7.9 To Add a description to a Database Object

Right click on the object and select properties.

Type Description in the Description box click OK.

Objects	Create tabl	Students Properties ?
III Tables	Create tabl	General
Queries	Create tabl	
E Fo:ms		
Reports		Type: Table
Pages	🛄 Pasua Error	Description: It contains the complete information of the student
🔁 Macros	Students	
🤹 Modules		Created: 4/17/2008 4:40:24 AM
Groups		Modified: 4/26/2008 9:55:20 PM
Ravorites		Owner: Admin
		Attributes: 🗖 Hidden 🛛 🗖 Replicable
	$\setminus \setminus$	🔲 Row Level Tracking

Figure 7.1 Adding Description to students table

To show the description in the database window

- 1. Right click anywhere in the background of the database window
- 2. Select view menu and click on details option.

You will see a window like above with the name of the object and its description.



Figure 7.2 Viewing the objects details

7.10 Creating the Tool Bar

- 1 Select View Menu
- 2 Select Toolbars
- 3 From Sub Menu of toolbar choose Customize
- 4 Under Toolbars Tab, click on New button
- 5 Give the name for new toolbar
- 6 Click on Commands Tab
- 7 Drag the tools which you want in the toobar when the customize dialog box is open. To remove the tools from toolbar you may drag them back when the customize dialog box is open.

7.11 Creating Shortcut Menu

You can create your own shortcut menu and attach them to forms, reports or controls.

To create a shortcut menu, First create a new toolbar.

1. Select this toolbar in the toolbars tab of he Customize dialog box.

- 2. Click on properties.
- 3. Change the setting of type to Popup
- 4. Click OK after you have read the instructions.
- 5. Select close.
- 6. Back in the customize dialog box, select shortcut menus on the toolbars list.MS-Access displays a shortcut menus toolbar with a choice called custom:
- 7. Click custom to show a list of custom shortcut menus.
- 8. Select the shortcut menu you want to work with.
- 9. Add tools to the chortcut menu as described earlier.

Close the Shortcut Menus toolbar

7.12 Analyzing a database

- 1. Open the database you want to check.
- 2. Select tools Menu and click on analyze option from the submenu select Performance from the menus.
- 3. You will see a Performance Analyzer dialog box.



Figure 7.3 Performance Analyser dialog box
- 4. For each object that you want to include in the analysis, check the box to the left of the items icon. You could select all the items at once by using the select all button
- 5. To analyze the relationship that are defined in a database, click on the current Database tab and check relationships.
- 6. Choose OK

7.12.1 To allow the Performance Analyzer to make changes

- 1 The Performance Wizard can take actions for the items it marks as Recommendations and Suggestions to make change:
- 2 Click any items you need to change.

Choose optimize.

3 When you are finished with the Performance Analiyzer click Close

7.12.2 Documenting a Database

MS-Access helps in creating database documentation that include table structures and field properties, from and report properties and other details.

To document an open database

- 1 Click on tools menu select the analyse option and then click on documenter.
- 2 Check the boxes for the objects that you would want to document.
- 3 If you want to check or change the items that are included in the documentation for the current tab's objects, click on the options button and make your selection before you click OK
- 4 If you want to print database properties and relationships, click on the Current Database tab and select Properties and Relationships.
- 5 Choose OK.
- 6 A preview window will open .

7.13 Startup Options

When ever you start MS-Access MS-Access Data Base Window opens .You are then required to select the Form in which you want to work and then choose the Form View to open it.

Both these task can be achieved if youselect the required form from the list in the Display Form/page .list box in **Startup** from the **Tools Menu.** The selected object will get displayed when you open database.

Startup		
Application Title:	Display Form/Page:	Oř
Application Icon:	xmClasxX (none) frmClassX ▼ Display Sracus SAr	Cancel
🔽 Use as Form and Report Joon		
Menu Bar:	Shortcut Menu Bar:	
(default)	(default)	
Allow Fuli Menus	Allow Built-in Toolbars	
🔽 Allow Default Shortcut Menus	🔽 Allow Tobibar/Menu Changes	
✓ Use Access Special Keys		
(Show Database Window, Show Immedia Window, Show VB Window, and Pause E	ste xecution)	

Figure 7.4 StartUp dilog box

Self Assessment Questions

- 1 Add Description to the various data objects you have created.
- 2 Write the steps to view the details of the data objects
- **3** Document the student_information database created by you.



Project : Student Result

Steps to create the project

Step 1 : Create a new database VEIS.

Step 2(a): Create a table with the name **BASIC**

	Field Name	Data Type
8	Reg No	Number
	Names	Text
	Access	Number
	с	Number
	C++	Number
	VB	Number
	Oracle	Number
	Java	Number

Step 2(b) : Apply the following data validations

Primary Key		Reg_No					
Required Property		Yes for all the feilds.					
Validation Rule	-	All the subjects should have marks between 0 to 100					
Validation Text	-	Enter the Marks correctly					

Step 3 : Design a query which calculates the total marks of a student.

Cretae two feilds TOTAL and PERCENTAGE in the Query Design View and enter the formula as shown in the figure (Fig Query Basic)

Note: <u>nz</u> allows a field to take null values when no data is entered.



Project

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VEIS

Step 4: Now create another query as shown in the figure. (Fig *Query - Da-tabase Skills*) The calclated values of the table can be used to analyse student knowledge of any subject(here databases). Calculate TOTAL and PECENTAGE of the two subjects.

Bas C C++ VB Ora Java	ic - cle							•
Field: Table: Sort: Show: Criteria:	Reg No Basic	Names Basic	Access Basic	Oracle Basic	Total: [Access]+[Orade]	Percentage: [tota]]*100 200		
or:								

Query - Database Skills

Step 5 : Create the following forms from the Queries designed above.

E Zie Edir Alexa insert Lõumar	<u>Records</u> <u>Tools</u> <u>Window</u>	<u>H</u> elp	
Roll No Marges Cess C	C++ VB racle Java	Total	Percentage
246 rohit 50 50	50 50 50	250	50

Form 1 (based on BASIC QUERY)

C	<u>F</u> ile	<u>E</u> dit	⊻iew	Insert	F <u>o</u> rmat	<u>R</u> ecords	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp			
24	Roll No Names				A	ccess	Oracle	Tota	al	Percentage	1. A.	
•		24	6 rohit	~			50	50	10	0	50	

Form2 - Database Skills Query - Database Skills

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Step 6: Now create the following Reports for the form created above

Reoprt 2 Sorted on the basis of Percentage based on Form named - BASIC



Reoprt 4 Sorted on the basis of Percentage based on Form named - Database Skills



Step 7 : Open a Blank Form in the design view and design the following form

Label

Command Buiton

Command Button

<u>MAIN FORM</u>

- Step 8 :Create the two command buttons of the MAIN FORM, say BASIC and
DATABASE SKILLS . By clicking on the button BASIC the form
BASIC should get ope. By clicking on the command button DATABASE
SKILL the form DATABASE SKILL shoud get open .
- Step 9: Now create two comand buttons on form BASIC,say PREVIEW EN-ROLL and PREVIEW PERCENTAGE. By clicking on the first button REPORT 1 should be displayed on the screen and by clicking on the second button REPORT 2 should be displayed on the screen.
- *Step 10*: Similarly open the form DATABASE SKILL and create two separate comaand buttons for previewing REPORT 3 and REPORT 4. Select the MAIN FORM as the start up form from the Start Up option.

