

LEARNING IN THIS CHAPTER

- Concept of Database
- Types and Structure of Database
- Features and Components of Microsoft Access 2010
- Creating a Blank Database
- Creating a Table using Templates
- Closing Access Application

A database is an organised way of storing information. It helps us to manage and access large amount of information quickly and efficiently.



Example

Unknowingly, we all use database in our daily life. We maintain our personal address diaries, wherein we record addresses and telephone numbers of our friends. We maintain the information alphabetically, so that whenever any information is needed, we could browse and extract the information quickly. From time to time, we keep on adding new addresses, and also update the contact numbers and postal addresses of our friends if there is any change. All these operations that we perform, like adding, updating, sorting, editing, deleting, etc., are the functions of a database.

Telephone diary, a dictionary, maintaining a list of students and their addresses, keeping their records pertaining to academic and co-curricular achievements, list of groceries in a grocery store, catalogue in a library, list of customers in a bank, maintaining employees' information in offices and organisations, etc., are the examples of different types of database.

It is very difficult to maintain a database manually when there are hundreds and thousands of records as the chances of committing errors increase. A computerized record keeping system is a collection of programs that enables you to store, modify, and extract information from a database known as **DBMS** (Database Management System). It saves our time and energy. Moreover to a great extent, it reduces the chances of errors creeping into the database. Therefore, data handling using DBMS becomes fast and efficient.

TYPES OF DATABASE

There are mainly two types of database:

FLAT FILE DATABASE : A **flat file database** refers to data files that contain records, which have a small, fixed number of fields, without any structured relationship. For example, Microsoft Excel.

RELATIONAL DATABASE : A **relational database** stores data in several tables and link those tables together to get a common piece of information. For example, Microsoft Access, Microsoft SQL, Oracle.

STRUCTURE OF DATABASE

A database contains a specific structure to store data. Let us study about some basic



Quick Quiz

Give any real life example of database, apart from the given one.



Let's Know More

Microsoft's **SQL Server** is an example of **DBMS** that serves database requests from multiple users.



Quick Quiz

What is the difference between a file and a database?

terminologies used in a database that will help us in getting acquainted with the functioning of a DBMS.

1. TABLES: Tables are the building blocks of a database. They store the complete data in a structured manner i.e., in the form of rows and columns. Every table has a finite number of columns and rows.

Elements of a Table

- ◆ **Fields:** All the columns in a table are called fields. A field describes a particular attribute of all the records in a table. For example, the field that mentions the Roll No. of the table: 'Students', will store the roll numbers of all students.
- ◆ **Records:** The rows in a table are called records. A record contains the values for all the fields that belong to a single person or an entity. For example, when we enter data of all the fields, such as Roll No., F_Name, and Marks for a given student, it creates a new row in a table, which is called a record.
- ◆ **Data:** A set of characters that represents a valid value is known as data. For example: 1, Sandeep, 89, 79 and 60 are the data values for the specific fields of the following table: 'Students'.

Table: Students				
Roll No.	F_Name	English	Maths	Hindi
1	Sandeep	89	79	60
2	Nitin	65	80	77
3	Dipti	90	88	70

Figure 3.1: Elements of a Table

- 2. QUERIES:** A database stores vast amount of data, but queries help us to retrieve the filtered data based upon some conditions. Queries are also used to perform actions, such as delete, update, etc., on the data, based upon some criteria (conditions).
- 3. FORMS:** Forms are the user friendly interfaces that facilitate the process of entering data in tables and queries. A form has an attractive interface that accepts data from the user and forwards it to the corresponding table or query.
- 4. REPORTS:** Reports are used to display selected data in a printable format. Reports collect the summarised data from one or more tables/queries and organise it in a printable form.

Definition: DBMS stands for Database Management System. It is an application software, which is used to create, modify and extract data from a database. It manages and organizes the records in the form of tables.

WHAT IS MICROSOFT ACCESS?

Microsoft Access is the most popular and powerful RDBMS (Relational Database Management System) that serves as an integral part of the Microsoft Office suite of application. It is used to organise and manipulate data. It organises data in the form of tables. It provides the facility to create relationship between these tables by using common fields. A relational database, enables to prevent duplicity of data. Another important feature of Access is that you can add, update, delete, view data and establish relationship by using forms, find and retrieve data in a desired way by using queries, and print data in a specific layout by using reports. Some other popular RDBMS are Sybase, Oracle, SQL (Structured Query Language).



Let us understand the concept of relationship with the help of an example :



To maintain students' database in RDBMS; instead of entering all the records in a single table, we will split our fields into two tables having a common column, such as Roll No.

1. STUDENTS INFORMATION TABLE

Roll No.	F_Name	Father's Name	Address	Tel. No.	Date of Birth
101	Kabir	Mr. R. Nanda	675/4, Pkl	2577899	21-01-1991
102	Manas	Mr. J.R. Nanda	212/2, Pkl	2645624	16-09-1984
103	Ridhima	Mr. D.B. Bhatia	C-46/58, Noida	2570066	24-10-1992

The 'Students Information' table consists of information about students. To enter the details of students' percentages and grades, you do not have to enter all the fields in a separate table, which have already entered in 'Students Information' table. You will take only a common field in the second table. By making a link on this common field, you can retrieve the desired set of records from both the tables.

2. MARKS TABLE

Notice that the values of the **Roll No.** field in **Marks** table are the same as the values in the **Students Information** table. You can define a relationship between both the tables using a common field i.e., Roll No. In this way, RDBMS reduces the duplicity of data.

Roll No.	Percentage	Grade
101	89%	A
102	59%	B
103	70%	B

FEATURES OF MICROSOFT ACCESS

- Access provides the facility to break large information into small parts, so that it is easy to access the information.
- Data redundancy (duplication of data) is reduced.
- It increases the efficiency, speed, and flexibility in searching and accessing information.
- Access facilitates sharing of data. Different users can use the same database to extract data according to their needs.
- Access provides data security features and maintains integrity, which is useful to make your data more consistent and reliable.
- Access provides the facility to create data forms, so that the user can enter the required information in the respective fields. It also reduces data entry errors.
- Queries help you to get information on a specific topic from the information stored in the database.
- Reports allow you to present the data in a meaningful and summarised manner.

Let's Discuss

Field
VS
Record



Quick Quiz

What are the different database objects in Microsoft Access?

Let's Know More

A **Primary** key is a sort of check, which uniquely identifies each record in a table. If more than one field is combined to form a primary key, then it is called a **Composite** key. A primary key field cannot have repetitive values and cannot be left blank.



Let's Discuss

Advantages of RDBMS

COMPONENTS OF MICROSOFT ACCESS 2010

Before learning about the various functions of Microsoft Access, let us get familiar with the various components of Microsoft Access window:

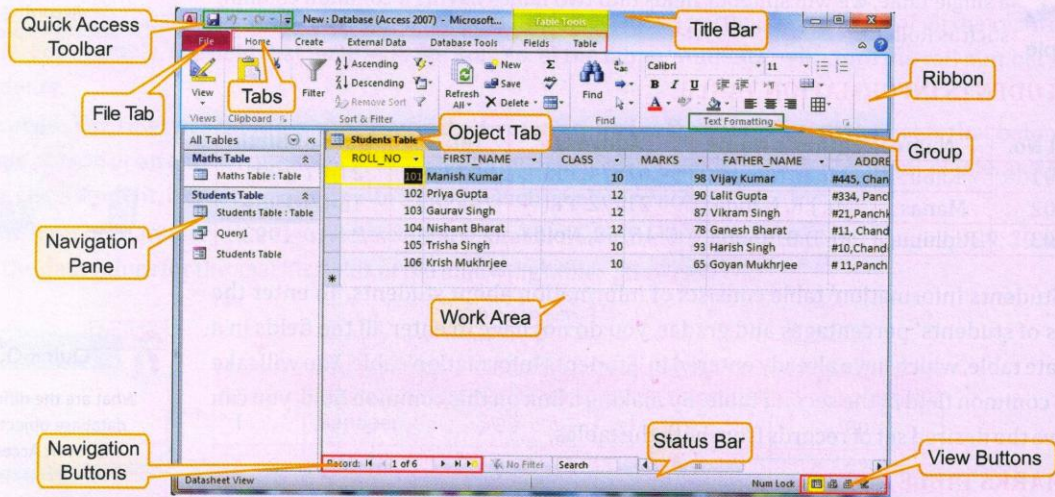


Figure 3.2: Components of Microsoft Access 2010

TITLE BAR : It is located at the top of the window and displays the name of the current database.

QUICK ACCESS TOOLBAR : This toolbar is present at the top left corner of the Access window. It contains the most frequently used command buttons. By default it has three buttons, which are Save, Undo and Redo.

RIBBON : It contains various tabs, each with several groups of relevant commands. Some tabs appear when you work with certain objects like Forms. Such tabs are called Contextual tabs.

NAVIGATION PANE : This pane is present on the left side of the Access window. It displays the name of the object used in the database, such as Table, Queries, Forms, Reports, etc.

NAVIGATION BUTTONS : As the name suggests, it helps in navigating through the records. The Navigation buttons display the current record number in an object.

OBJECT TABS : The objects that you have opened in a database appear right above the work area in a tabbed form. Clicking on any tab displays the contents in the work area. To close the current tab, click on the cross button on the right end of the bar.

STATUS BAR : This bar is located at the bottom of the window. On its extreme left, it displays the name of the current view, and on its right, it displays four View buttons, which are Datasheet View, Design View, PivotTable View and PivotChart View.

CREATING A BLANK DATABASE

Microsoft Access allows you either to create a new database from scratch or create a database by using preinstalled templates. Access provides many automated wizards that help in making a database, tables, forms, reports, etc. To open Microsoft Access, click on **Start > All Programs > Microsoft Office > Microsoft Access 2010**.

- When Access opens, you will find the **Backstage View** on the screen. Click on the **File** tab and select the **New** option.

- Under the **Available Templates** section, select the **Blank database** option.
- You will get a **Blank database** task pane on the right that prompts you to create a file.
- Specify the file name in the **File Name** text box.
- If required, you can change the path from the **Browse** button placed adjacent to the **File Name** box.
- Click on the **Create** button. A new database will be created along with an empty table named **Table1** displayed on the **Title bar**.
- A new tab, i.e., **Table Tools** will be now visible on the **Title bar**.

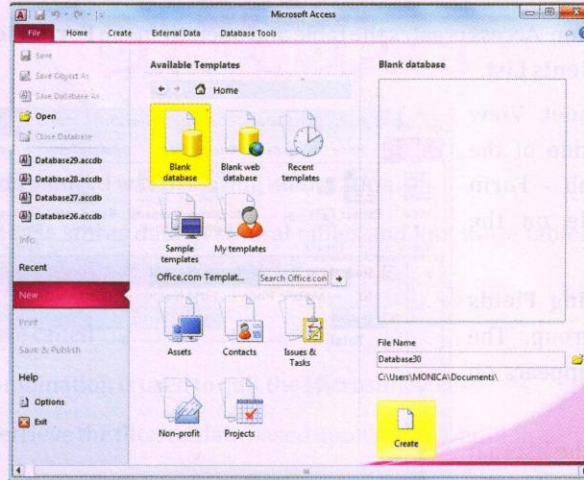


Figure 3.3: Getting Started Window

NOTE

- When you open a new or existing database in Office Access 2010, the objects in your database - tables, forms, queries, reports, etc., appear in the **Navigation Pane**. To view the objects, click on the drop-down arrow of **All Access Objects** in the **Navigation Pane**.
- The **Fields** tab is selected by default.

CREATING A TABLE USING TEMPLATES

One of the easiest ways to create a table is to use a template. A template is a ready-to-use database that contains various types of tables, queries, forms, etc., needed to perform a specific task.

- Click on the Microsoft Access 2010 button, the **Backstage View** appears on the screen.
- Now select **Sample templates** category under the **Available Templates**.
- Access will display the list of all the available templates. Select any template from the displayed list. Here we have selected the **Students** template.

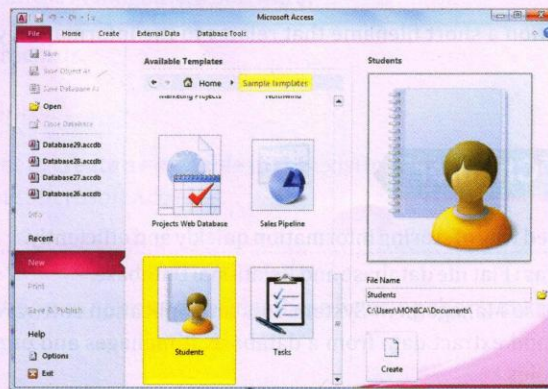


Figure 3.4: Using Sample Templates

Let's Know More

The standard file name extension for database in Microsoft Office Access 2010 is **.accdb**.

Quick View

To save the database, press **Ctrl+S** key combination or choose **Save** option from the **File** tab.



Quick View

To quit Microsoft Access, press **Alt+F4** key combination.

Let's Know More

The **Datasheet View** allows you to enter data in a table. It looks like an Excel spreadsheet.

Know the Fact

Templates are pre-built database focused on a specific task. These can be used instantly and can also be downloaded.

- ◆ The Students database task pane appears on the right side.
- ◆ Specify the file name in the **File Name** box.

NOTE

Access suggests a file name in the **File Name** box, and also allows you to change it as per your requirement.

- ◆ Click on the **Create** button. Access creates the table and opens it in the **Form View**. It contains the fields which are relevant to the **Students List**.
- ◆ Click on the **Datasheet View** button on the right side of the **Status** bar. A new tab - **Form Tools** is now visible on the **Title** bar.
- ◆ Select the **Add Existing Fields** button in the **Tools** group. The **Field List** task pane appears on the right side.
- ◆ Select the fields from the list that you want to include in the **Student List**.
- ◆ Drag the selected field to the table and drop it where you want to position it, when the insertion point appears.
- ◆ By default **ID** is defined as the Primary key of **Student List**.

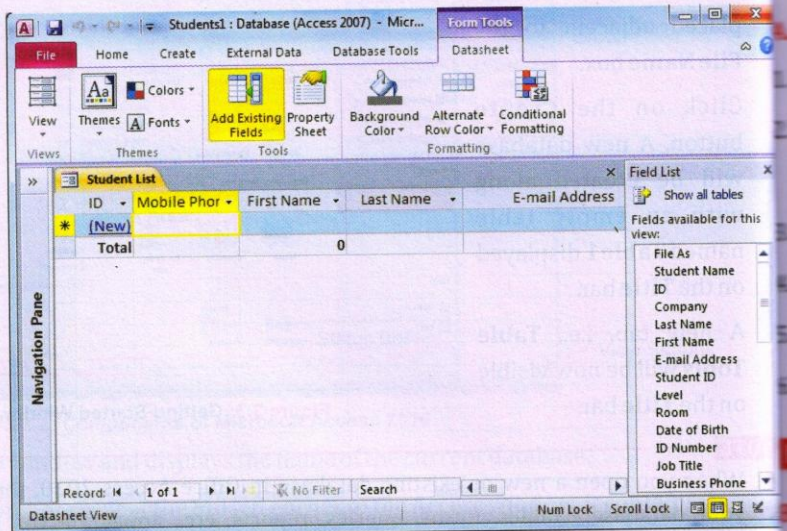




Figure 3.5: Using Sample Templates

➡ CLOSING ACCESS APPLICATION

- ◆ After finishing the work in Access, click on the **Close Database**  option in the **File** tab to close the current database.
- ◆ To close Microsoft Access application, click on the **File > Exit**  option.



It is advisable to mention a short filename that relates to the information you store in your database.



Recap of the Chapter

- ◆ A database is an organised way of storing information quickly and efficiently.
- ◆ Database is categorised as : Flat file database and Relational Database.
- ◆ DBMS stands for Database Management System. It is an application software, which is used to create, modify, and extract data from a database. It manages and organizes the records in the form of tables.

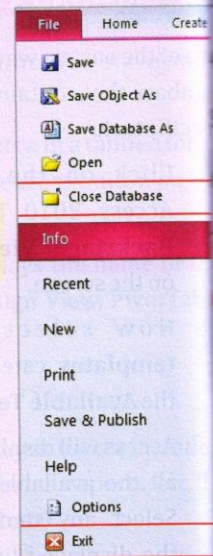


Figure 3.6: Closing Microsoft Access

- Microsoft Access is the most popular and powerful RDBMS used to organise and manipulate data.
- Templates are pre-built database focused on a specific task. They can be used instantly and can also be downloaded.

Brain DEVELOPER

A. Fill in the blanks:

1. A is an organised way of storing information.
2. A database stores data in several tables and link those tables together to get a common piece of
3. All the columns in a table are called
4. key combination is used to quit the Microsoft Access.
5. help us to retrieve the filtered data based upon some conditions.
6. contains the values for all the fields that belongs to a single person or an entity.

HINTS

- Information
- Database
- Relational
- Queries
- Alt+F4
- Fields
- Record

B. State True or False:

1. Microsoft Access is a Database Management System.
2. A set of characters that represents a valid value is known as data.
3. In flat file database system, you can make links.
4. You can create a relationship between two tables by using a unique field.
5. Tables, queries, reports and forms can be created in Microsoft Access.
6. DBMS stands for Data and Business Management Software.
7. The rows in a table are called records.

C. Application Based Questions:

Supriya is given an assignment to create a new table in the existing document. Suggest her the option, which she should select after opening Microsoft Access.

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Mansi wants to quit Microsoft Access after saving a database by using shortcut keys. Which key combination will you suggest her to use?

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D. Multiple Choice Questions:

1. is the shortcut key combination to save the database.
a. Ctrl+C b. Ctrl+S c. Ctrl+V
2. is an application software, which is used to create, modify and extract data from a database.
a. DBMS b. DBBS c. DDMS
3. is the standard file name extension for database in Microsoft Office Access 2010.
a. .abcd b. .accd c. .accdb
4. There are mainly types of database.
a. Two b. Three c. Four
5. are the user friendly interfaces that facilitate the process of entering data in tables and queries.
a. Report b. Forms c. Queries
6. Which option displays the name of the current database on which you are working?
a. Objects tabs b. Status bar c. Title bar

E. Answer the following:

1. What is a Database ? Give examples of a database.

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2. Explain any four features of Microsoft Access.

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3. What are the types of database? Explain each of them briefly.

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F. Define the following terms:

Tables :

Data :

Reports :