

**Your Aim**

to learn about:



- Concept of a database
- Advantages of a database system
- MS Access 2010
- Data types in MS Access 2010
- Rules for writing a field name in MS Access
- Types of databases
- Structure of a database
- Components of MS Access 2010
- Types of views in MS Access
- Creating a table

INTRODUCTION

Earlier, paper-based files were used to store data. But this system had various drawbacks such as prone to damage, editing problem, data repetition, and difficult to manage. Retrieving data from file-based systems was very tedious and time-consuming task. To overcome the problems in file-based systems, computerised database system was introduced in 1960s.

CONCEPT OF A DATABASE

Database implies that organising the data in a manner which helps to store and retrieve a large amount of data efficiently. The database concept is one of the oldest ways to maintain records in a conventional file-oriented data collection system.

Computerised data collection and manipulation systems have replaced the conventional record keeping systems by using application programs. The various components of the computerised database system have a logical relationship that helps in accessing data easily.

A collection of programs required to store and retrieve data from a database is called **Database Management System (DBMS)**.

TYPES OF DATABASES

There are mainly two types of databases:

- * **Flat File Database:** It is a type of database that contains records having small number of fields without any structured relationship between them. The most popular example of flat file database is MS Excel 2010.

Microsoft Office
Excel 2010

- * **Relational Database:** It is a type of database that stores data in several tables and links those tables together to get a common piece of information. Commonly used relational database systems are Microsoft Access, Microsoft SQL, ORACLE, etc.



Relational Databases

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The relational database was proposed by Edgar F. Codd. He gave a set of thirteen rules (Codd's rules) to define a Relational Database Management System.

ADVANTAGES OF A DATABASE SYSTEM

A database system has many benefits. Some of the important benefits or advantages are:

- * It minimizes the duplication of data by integrating and sharing the data files.
- * It saves the storage space.
- * All the users are provided with some access rights or privileges and permissions.
- * The files can be easily updated whenever any changes are being made.

STRUCTURE OF A DATABASE

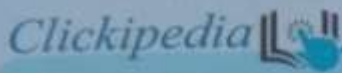
Data is stored in the table of a database, as shown in below diagram.

		FIELDS				
RECORDS		Reg No.	Name	Father's Name	Date of Birth	Class
		187/11	Krishna Kant	Mr. K.S. Kant	15/08/2007	VIII
		156/12	Rishi Sharma	Mr. N.K. Sharma	22/10/2008	IX
		194/11	Suraj Patel	Mr. G.S. Patel	16/04/2008	IX
		123/12	Priyansh Sagar	Mr. P.K. Sagar	18/06/2007	VIII

The commonly used terms of the relational database are:

- * **Table:** It is a group of related data organised in columns and rows in a database. The columns contain a number of headings such as Reg No., Name, Father's Name, Date of Birth, Class, etc. These are known as **Fields**. A set of values for the fields is called the **Record**. Record is one row of the table.
- * **Primary Key:** It is a unique field by which the records are uniquely identified in a table. A table can have only one primary key. For example, in a student's record the 'Reg No.' can be called a primary key.

- * **Query:** A query is the most powerful feature of database. It helps you to retrieve information from a table based on some criteria or condition. You can ask, find and retrieve data from the database just by creating and running the query.
- * **Report:** The final result of the manipulated data that comes from tables or queries in DBMS is known as the report. It is specially designed to display or print the data in the formatted way.
- * **Form:** When a query runs, the database system retrieves the information from the table and makes it available to the user through form. It also provides a user interface to enter, edit and view information.



If more than one fields are combined to form a primary key, then it is called a composite key.

MS ACCESS 2010

MS Access is a powerful and easy to use Relational Database Management System which is a part of MS Office Suite. It provides handy tools that help in operating, maintaining and manipulating the records more effectively.

It is one of the most popular RDBMS (Relational Database Management System). It prevents the duplicity of data. It allows you to add, delete, modify and update the records in a database by establishing a relationship between the tables.

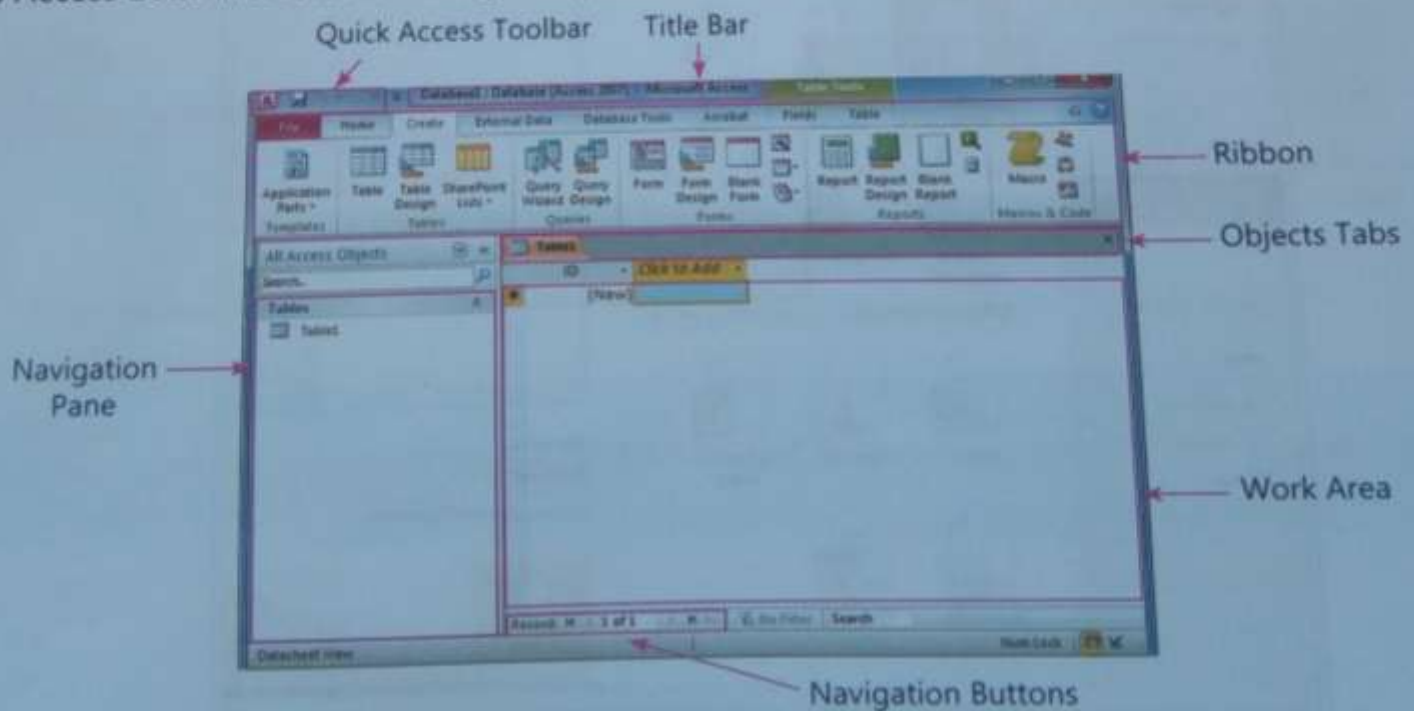


MS Access 2010

To start MS Access 2010, click on **Start** → **All Programs** → **Microsoft Office** → **Microsoft Access 2010**. This will open MS Access window.

COMPONENTS OF MS ACCESS 2010

MS Access 2010 have the following components:



Components of MS Access 2010

- * **Quick Access Toolbar:** It is a small strip present at the top-left corner of the MS Access 2010 window. It contains four buttons named Application, Save, Undo and Redo.
- * **Title Bar:** It is the topmost bar of the MS Access window that displays the name of the currently opened database.
- * **Ribbon:** It is a long bar present below the Title bar. It is divided into different tabs such as File, Home, Create, etc. These tabs are further divided into groups. These groups contain various commands of MS Access 2010.
- * **Navigation Pane:** This pane is present on the left side of the Access window. It displays the names of the objects used in the database such as Table, Query, Form, etc.
- * **Navigation Buttons:** These buttons help in navigating through the records.
- * **Work Area:** It is the area where we add the records to the different fields in the table.
- * **Objects Tabs:** The objects such as Tables, Queries, and Forms that we open in the database are present in the form of tabs under the Ribbon.

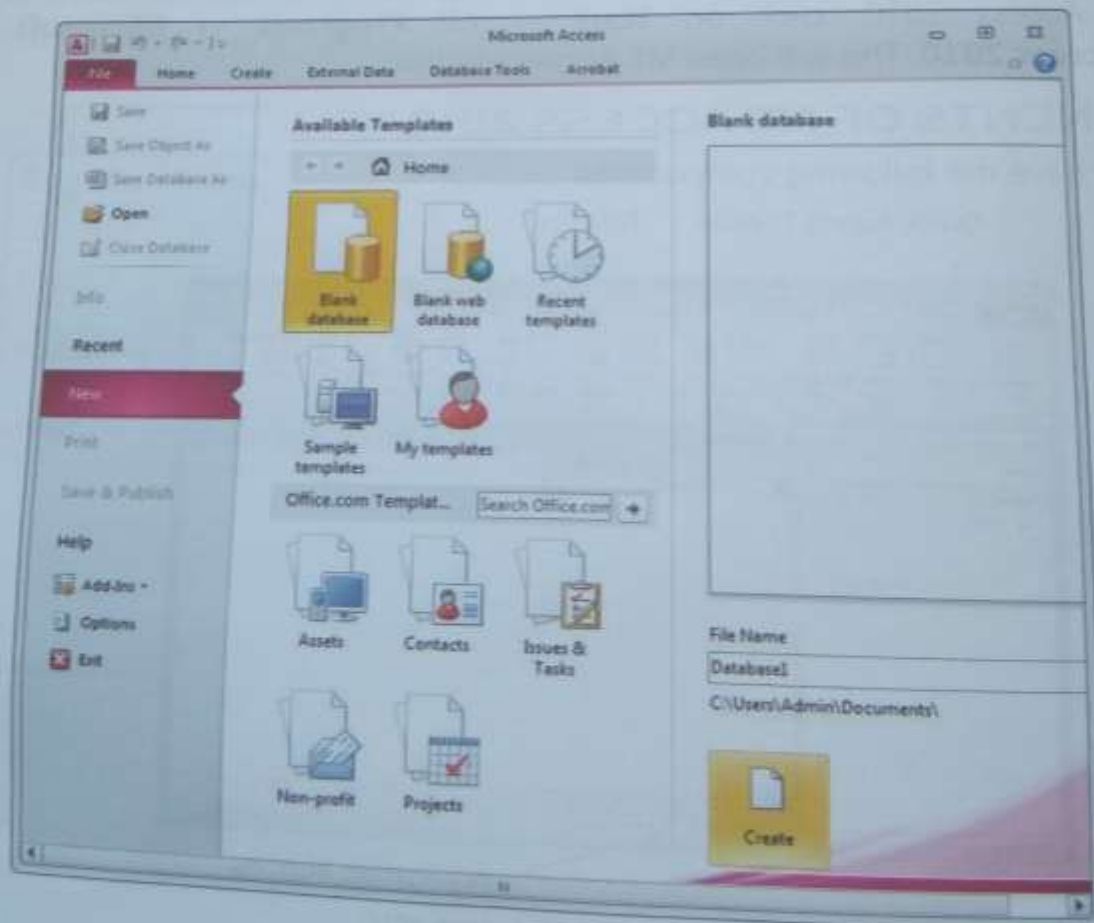
Creating a Database

There are two ways to create a database.

Creating a Blank Database

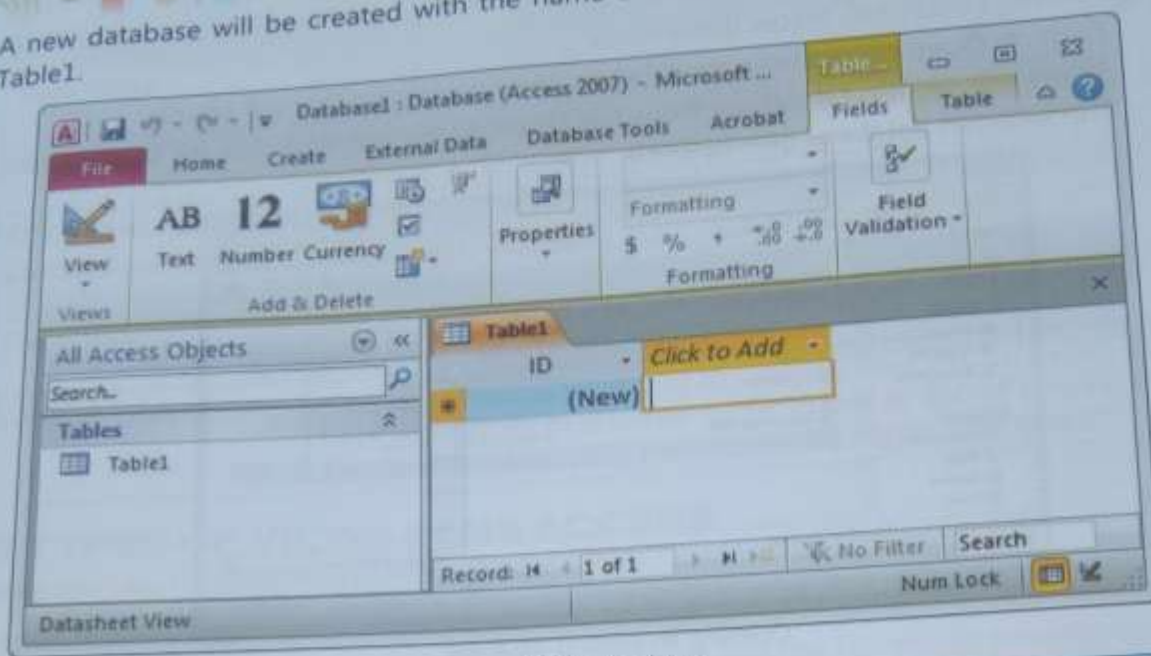
To create a blank database, follow these steps:

- Step 1 Click on the **File** tab and select **New** option.
- Step 2 Click on the **Blank database** and then click on the **Create** button.



Creating a blank database

A new database will be created with the name Database1 along with an empty table named Table1.



Blank database

Creating a Database Using Templates

- Step 1 Click on **Microsoft Access 2010** button.
- Step 2 Select the **Sample Templates** category under the **Available Templates**.
- Step 3 Select any template from the available list.
- Step 4 Click on the **Create** button.



Creating database using templates



To save the changes in the database, press **Ctrl + S** keys or choose the **Save** option from the **File** tab.

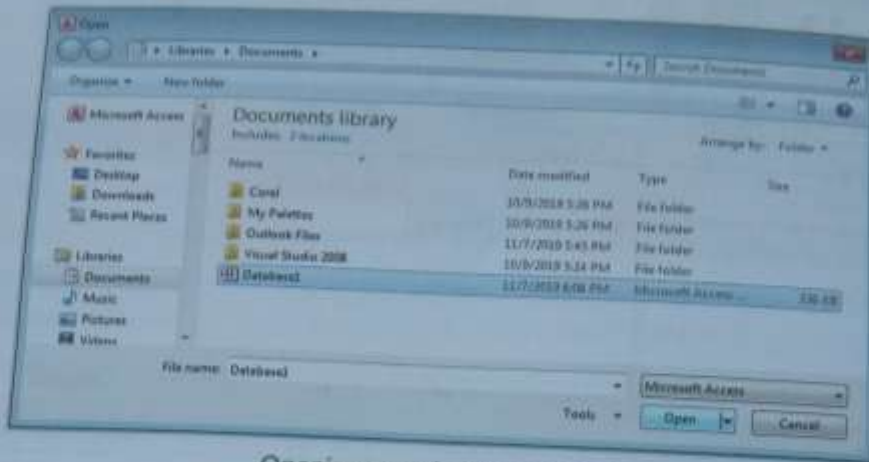
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Templates are the inbuilt format of databases that focus on the specific task. These can be downloaded or used instantly.

Opening an Existing Database

To open an existing database, follow these steps:

- Step 1 Click on **Open** option from the **File** tab. The open dialog box will appear.
- Step 2 Select the required database from the **Open** dialog box and click on **Open** button. The selected database gets opened.



Opening an existing database



Shortcut to open an existing database is Ctrl+O keys.

Closing Database

Select the **Close Database** option from the File tab to close the current database.

DATA TYPES IN MS ACCESS 2010

The data types are used to declare the type of the fields in the database. MS Access 2010 provides the following data types:

Data Type	Description
Text	It is used to store text or a combination of text and number. It can have maximum of 255 characters. It cannot be used for numeric calculations.
Memo	It is used for detailed and descriptive fields. It stores up to 65,536 characters.
Number	It is used to enter numerical values and perform numerical calculations. The maximum size of the Number field is 16 bytes.
Auto Number	It stores a sequential number automatically for every record added to a table. The maximum size of the field is 4 bytes.

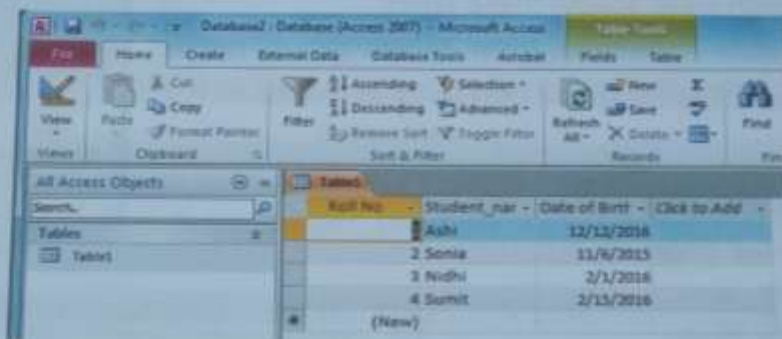
Data Type	Description
Date/Time	It is used to store the information like date of birth, date of joining, etc. The maximum size of the field is 8 bytes.
Yes/No	It is used in places where the fields can have boolean value. It can be either True (T) or False (F).
OLE (Object Linking and Embedding)	It is used to embed an object created in another application such as MS Word, MS Excel or MS PowerPoint. The maximum size of the field is 2 bytes.
Hyperlink	It is used to store the links to web pages, websites, files, etc. The maximum size of the field is 1GB.
Lookup Wizard	A Lookup Wizard helps you to create a field whose values are chosen from the values in another table, query or list of values. By default, Access sets the Lookup fields to the Number data types.

TYPES OF VIEWS IN MS ACCESS

There are two types of views in MS Access:

Datasheet View

It is the default view of the table. It shows all the fields and the records as entered by the user. In this view, you can edit the content of the table.

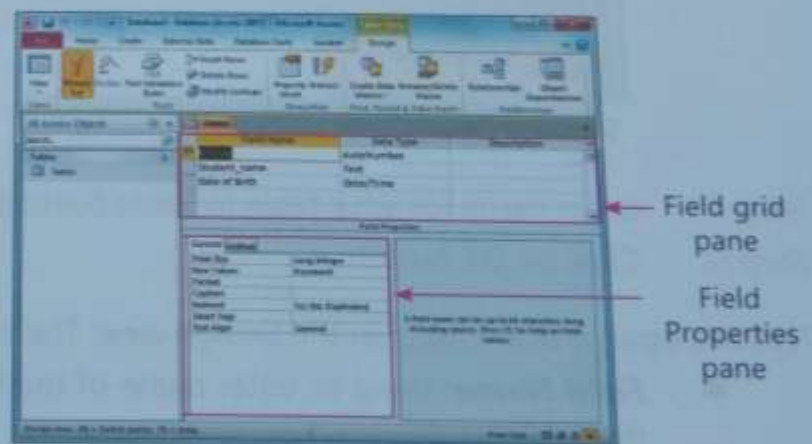


Datasheet view

Design View

In this view, the records are not visible. You can only see the field names along with their data types. You can add or delete a field name. The Design view is divided into two parts:

- * **Field Grid Pane:** It is used to define the field names and their data types.
- * **Field Properties Pane:** It is used to set the properties for the fields defined in the table.



Design view

RULES FOR WRITING A FIELD NAME IN MS ACCESS

Following rules you should remember while writing field names:

- * The field name can be up to 64 characters long.
- * It can include any combination of letters, numbers, spaces, and special characters except a period (.), an exclamation mark (!), an accent grave (`) and brackets ([]).
- * It cannot begin with the leading spaces.
- * It cannot include a double quotation mark (").

CREATING A TABLE

Table can be created in three ways:

- * Creating tables in Design View.
- * Creating tables in Datasheet View.
- * Creating tables by using Templates.

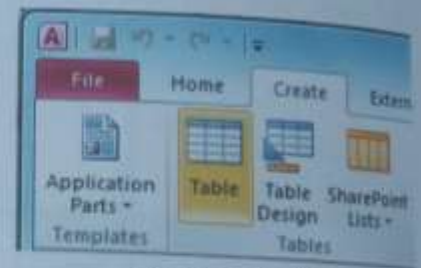
Let us create a table using Design view.

Creating a table using Design View

In this view, you can define fields which are to be included in the table. You can simultaneously define properties of these fields also.

To create table in Design view, follow these steps:

- Step 1 Click on Table command from Tables group under Create tab. This will create a new table as Table1 in the database.

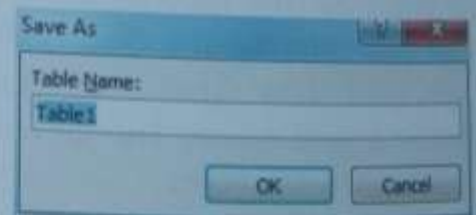


Creating a Table



Selecting Design View

- Step 2 Click on View command from Views group under Home tab.
- Step 3 From the drop-down list that opens, click on Design View. This will open Save As dialog box.



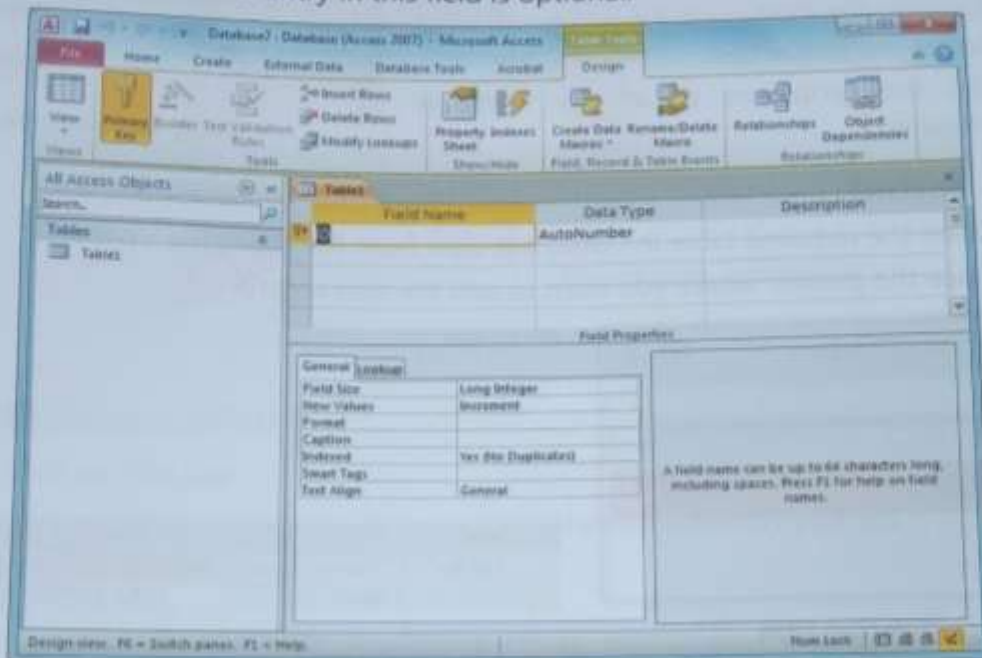
Save As dialog box

- Step 4 Enter name for your table in Table Name text box.
- Step 5 Click on OK button.

This will open a blank table in the Design view. The table is divided into three columns:

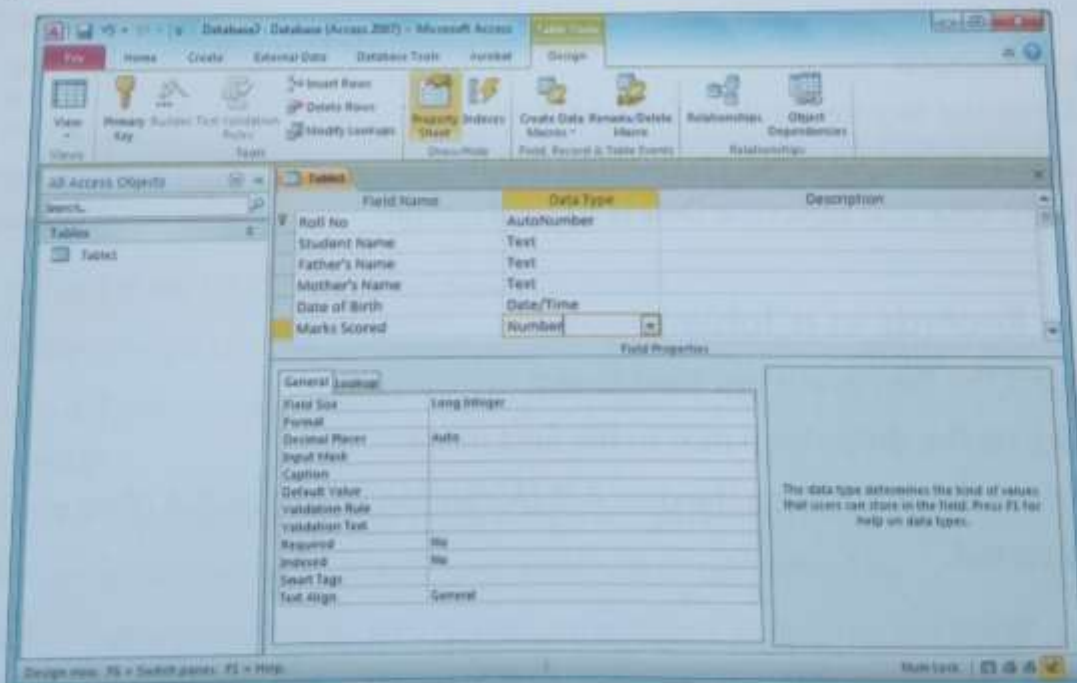
- * **Field Name:** Used to enter name of the field to be displayed as column heading in the table.

- * **Date Type:** Used to define the type of data that can be entered in that field. The commonly used data types in Access are Text, Number, Date/Time, Currency, AutoNumber, Yes/No, etc.
- * **Description:** Used to give additional comments or information to the user while entering data. The entry in this field is optional.



Design View

By default, Access names the first field as ID and assigns it as a **Primary Key**. The default Data Type for the Primary Key field is AutoNumber. Enter the names of the fields and assign suitable data types.



Entering field names

To move between columns and insert new fields at the end, press Tab key.
The detailed properties of each field can be defined in the Field Properties pane according to the rules for writing a field name discussed earlier.

Setting Field Properties

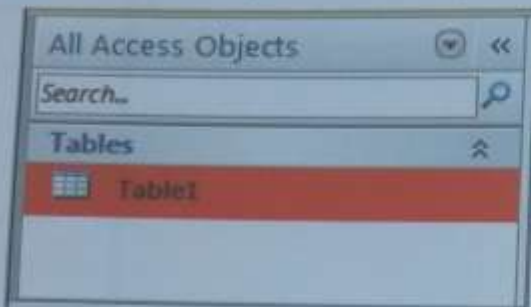
- Step 1 Click on the field name for which you want to set the properties.
- Step 2 Set the properties of all the fields as required.

Field Name	Data Type
Roll No	AutoNumber
Student_name	Text
Date of Birth	Date/Time

Setting field properties

Adding a Record

- Step 1 Open the required table in Datasheet view from the Navigation pane.
- Step 2 Place the pointer where you want to add the new record.



Selecting table

Roll No	Student_name	Date of Birth	Click to Add
1	Ashi	12/12/2016	

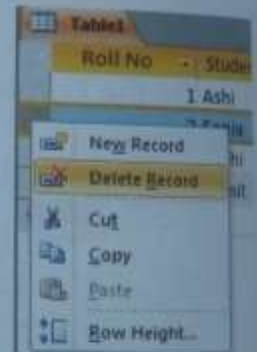
Adding record

Editing a Record

- Step 1 Open the required table in Datasheet view.
- Step 2 Double-click on the record which you want to edit.

Deleting a Record

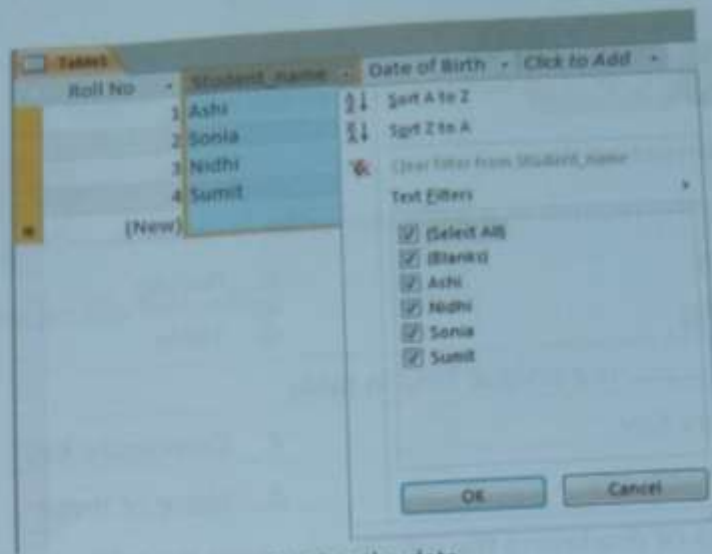
- Step 1 Open the required table in Datasheet view.
- Step 2 Select the record which you want to delete.
- Step 3 Right-click and select the **Delete Record** option.



Deleting a record

Sorting the Records in a Table

- Step 1 Select the field which you want to sort.
- Step 2 Click on the drop-down next to the field name.
- Step 3 Choose whether to sort the data A-Z (Ascending Order) or Z-A (Descending order).
The data gets sorted.



Sorting the data

Exiting MS Access 2010

- Step 1 Click on **File** tab.
- Step 2 Click on **Close Database**. It closes the database currently opened.
- Step 3 Click on **File** tab again.
- Step 4 Click on **Exit** option.

Reboot

- * A collection of programs required to store and retrieve data from a database is called Database Management System (DBMS).
- * There are mainly two types of database - Flat File Database and Relational Database.
- * Table is a group of related data organised in columns and rows in a database.
- * The columns contain a number of headings such as name, date of birth, class, pin no, etc; is known as fields.
- * A set of values for the fields is called the record.
- * Primary key is a unique field by which the records are identified in a table.
- * Query allows you to retrieve information from a table based on some criteria or condition.
- * The final result of the manipulated data that comes from tables or queries in DBMS is known as the report. It is specially designed to print the data.
- * When a query runs, the system retrieves the information from the table and makes it available to the user through the form.

A. Tick (✓) the correct option.

1. Arranging the records in a particular order is called

a. Query <input type="checkbox"/>	c. Report <input type="checkbox"/>
b. Sorting <input type="checkbox"/>	d. Table <input type="checkbox"/>

2. is a unique field in table.

a. Primary Key <input type="checkbox"/>	c. Composite Key <input type="checkbox"/>
b. Secondary key <input type="checkbox"/>	d. None of these <input type="checkbox"/>

3. The process of displaying the information from the table is called

a. Query <input type="checkbox"/>	c. Form <input type="checkbox"/>
b. Report <input type="checkbox"/>	d. Wizard <input type="checkbox"/>

4. stores a sequential number for every record in a table.

a. Serial <input type="checkbox"/>	c. Auto Number <input type="checkbox"/>
b. Autofill <input type="checkbox"/>	d. Time/date <input type="checkbox"/>

5. A table can be created by using

a. Design view <input type="checkbox"/>	c. Datasheet view <input type="checkbox"/>
b. Templates <input type="checkbox"/>	d. All of these <input type="checkbox"/>

B. Write 'T' for true and 'F' for false. Correct the false statements.

1. There are two types of databases.
2. Navigation Pane is present on right side of MS Access window.
3. The maximum size of Number field is 32 bytes.
4. Field name can begin with underscore (_).

C. Fill in the blanks using the words given below.



Hints

field, sort, table, primary, navigation

1. The collection of related records is called
2. The columns in a table represent
3. The key is defined in order to show the uniqueness of the data.

4. is used to sort the data either in ascending or descending order.
5. buttons are used to navigate through the records.

Let's Do It



A. Write a short note on the following.

1. Primary Key
2. Report
3. Query
4. Form

B. Short answer type questions.

1. What is the process of adding and deleting the records from the database?
2. Differentiate between Datasheet view and Design view.

C. Long answer type questions.

1. What are the advantages of the Database Management System?
2. Explain the types of views in a database.
3. What are the rules for writing a field name in a database?

Crack The Code



A. Application based question.

Ranjeet wants to create a table in MS Access by using built-in fields. Which way can he use to do so?

B. Find six terms related to MS Access 2010 in the following grid.

P	A	B	E	A	U	T	B	D	E	Z	L
R	S	N	L	S	O	M	E	M	N	D	O
I	M	O	O	Z	N	L	A	D	F	A	R
M	T	Q	U	E	R	Y	L	M	L	T	Q
A	L	M	S	F	E	T	O	M	Q	A	B
R	Z	Y	U	L	P	M	T	A	Q	B	F
Y	X	L	N	M	O	S	A	L	A	A	M
K	S	U	V	P	R	T	B	M	R	S	Z
E	L	L	O	P	T	S	L	N	F	E	A
Y	M	N	F	O	R	M	E	L	Z	Y	B



A. Write a short note on the following -

1	<p><u>Primary Key</u> – It is a unique field by which the records are uniquely identified in a table. A table can have only one primary key.</p>
2	<p><u>Report</u> – The final report of the manipulated data that comes from tables or queries in DBMS is known as the report. It is specially designed to display or print the data in the formatted way.</p>
3	<p><u>Query</u> – Query helps you to retrieve information from a table based on some criteria or condition. You can ask, find and retrieve data from the database just by creating and running the query.</p>
4	<p><u>Form</u> – When a query runs, the database system retrieves the information from the table and makes it available to the user through form. It also provides a user interface to enter, edit and view information.</p>

B. Short answer type questions.

Qu. 1	What is the process of adding and deleting the recording form the database?
Ans.	<p><u>Adding a Record</u> – Step 1 – open the required table in Datasheet view from the navigation pane. Step 2 – Place the pointer where you want to add the new record.</p> <p><u>Deleting a Record</u> – Step 1 – Open the required table in Datasheet view. Step 2 – Select the record which you want to delete. Step 3 – Right click and select the Delete Record option.</p>
Qu. 2	Differentiate between Datasheet view and Design view.
Ans.	<p><u>Datasheet View</u> – It is the default view of the table. It shows all the fields and the records as entered by the user. In this view, you can edit the content of the table.</p> <p><u>Design View</u> – In this view, the records are not visible. You can only see the field names along with their data types. You can add or delete a field name.</p>

C. Long answer type questions.

Qu. 1	What are the advantages of the Database Management System?
Ans.	<p><u>Advantages of a Database System –</u> A database system has many benefits. Some of the important benefits or advantage are –</p> <ul style="list-style-type: none"> • It minimizes the duplication of data by integrating and sharing the data files. • It saves the storage space. • All the user are provided width some access rights or privileges and permissions. • The files can be easily updated whenever any changes are being made.
Qu. 2	Explain the types of views in a database.
Ans.	<p><u>Types of views In MS Access –</u> There are two types of views in MS Access –</p> <p><u>Datasheet View –</u> It is the default view of the table. It shows all the fields and the records as entered by the user. In this view, you can edit the content of the table.</p> <p><u>Design View –</u> In this view, the records are not visible. You can only see the field names along with their data types. You can add or delete a field name. The Design view is divided into two parts –</p> <ul style="list-style-type: none"> • Field Grid Pane • Field Properties Pane
Qu. 3	What are the rules for writing a field name in a database?
Ans.	<p><u>Rules for writing a field name in MS Access –</u> Following rules you should remember while writing field names –</p> <ul style="list-style-type: none"> • The field name can be up to 64 characters long. • It can include any combination of letters, numbers, spaces, and special characters except a period (.), an exclamation mark (!), an accent grave (‘) and brackets ([]). • It cannot begin with the leading spaces. • It cannot include a double quotation mark (“).

Activity -

The screenshot shows the Microsoft Access interface in Design view for a table named 'tblEmployees'. The ribbon is set to 'TableTools - Design'. The 'TableTools Tab' is highlighted. The 'All Access Objects' pane on the left shows a 'List of Tables' containing 'tblEmployees'. The table design grid shows the following fields:

Field Name	Data Type	Description
AutoNumber	AutoNumber	
FirstName	Text	
LastName	Text	
HireDate	Date/Time	

The 'tblEmployees' field is marked as the 'Primary Key'. The 'HireDate' field is highlighted, and its 'Field Properties' are shown in the bottom pane. The 'Field Properties' pane is also highlighted.

Annotations with red arrows point to:

- Change Table View**: Points to the 'View' button in the ribbon.
- List of Tables**: Points to the 'tblEmployees' entry in the 'All Access Objects' pane.
- TableTools Tab**: Points to the 'TableTools - Design' ribbon tab.
- Primary Key**: Points to the 'tblEmployees' field in the design grid.
- Field Name**: Points to the 'HireDate' field name in the design grid.
- Data Type**: Points to the 'Date/Time' data type in the design grid.
- Table Fields**: Points to the 'HireDate' field in the design grid.
- Field Properties**: Points to the 'Field Properties' pane at the bottom.
- Field Properties**: Points to the 'Field Properties' pane at the bottom.

Design view. F6 = Switch panes. F1 = Help.