MS ACCESS 2010

SNAP RECAP

1. Why do you need to store data in tables? Give an example.
2. Name some applications you can use to store tabular data.

LEARNING OBJECTIVES

You will learn about:
- important terms related to databases
- functions of DBMS and database objects
- starting MS Access 2010
- creating a new database in MS Access 2010
- components of the MS Access 2010 window
- data types and the primary key
- changing the view
- creating and modifying tables in MS Access 2010
- saving a database in MS Access 2010
- opening an existing database
- queries, forms and reports in MS Access 2010.

Introduction

A database refers to the arrangement and storage of data in a way that allows it to be retrieved easily. Microsoft Access is a database program that is used for storing all kinds of information in the form of tables, queries, forms, reports, etc. It has many built-in features to assist you in constructing and viewing the information stored in the database. Once the information is stored in the Microsoft Access database, it is easy to find, analyse and print. This chapter uses MS Access 2010. For MS Access 2016 updates, go to the end of the chapter.

Important database terms

Database: A database is an integrated collection of logically related records in the form of tables. It offers an organised mechanism for storing, managing and retrieving information related to a particular subject or purpose. For example, a database can be created for schools, libraries, banks, etc.

Database Management System (DBMS): A DBMS is a set of computer programs that controls the creation, maintenance and use of the computerised database by the user. Some examples of popular DBMS software are MS Access, FoxPro and FoxBASE.

Table: A table is a collection of related information in the form of rows and columns. For example, the diagram below shows the structure of a School database where the tables Student, Library and Staff store different pieces of information related to students, the books in the library and the school staff.
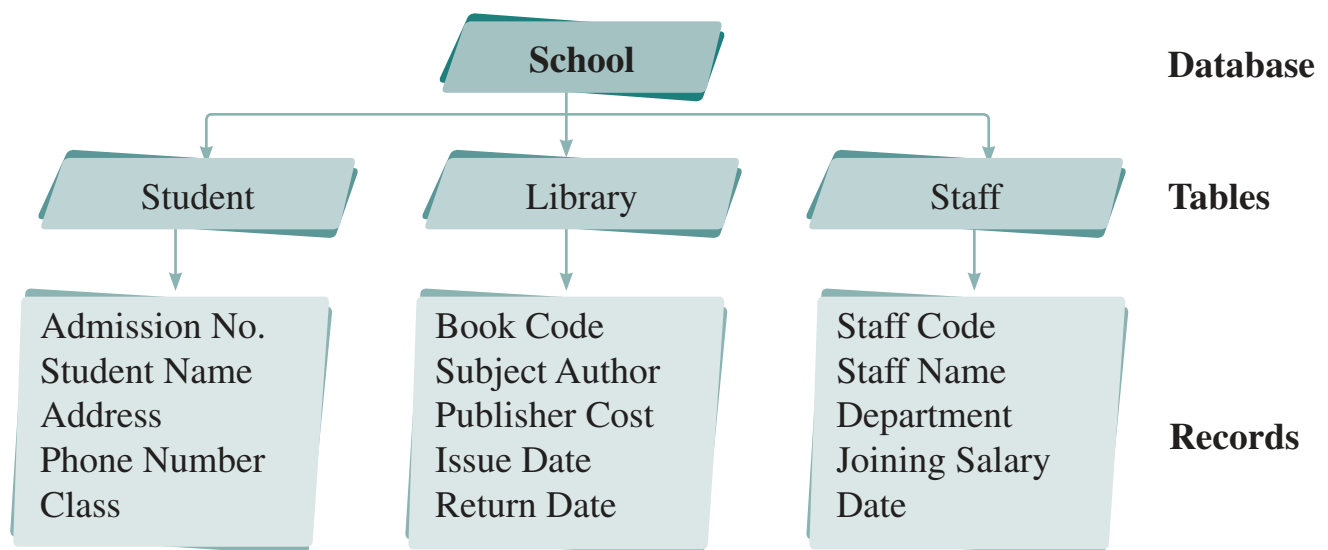
Structure of a database

Record: A record is one row of a table. It includes complete information arranged horizontally. For example, the Student table may contain the complete information for a student, such as Admission No., Student Name, Address, Phone Number and Class.

Field: A vertical column in a table that stores information of the same type. For example, Admission No. is a field that stores only admission numbers, and Student Name stores only the names of the students.

Functions of DBMS

A DBMS performs the following important functions to ensure the integrity and consistency of data in the database:

- **Reduces data redundancy**: Data redundancy means duplication of data. A DBMS helps to remove duplicate data. For example, in a library, the name of a book may occur under the author's name and the ISBN number.

- **Facilitates sharing of data**: Different users can access and use the same database. For example, the Admissions department can use the School database for storing and retrieving Admission No. of the students, while the teachers can use the same database for retrieving the Student Name.

- **Controls data inconsistency**: A change in any one file is automatically updated in all the related files. For example, in a library, if there are two records for a single book, one under the author's name and another under new stock, the details might be changed under one record. This may lead to inconsistency as both the records for the same book would contain different information. A DBMS stops this from happening.

- **Enforces standards**: In a DBMS, certain standards can be applied in data representation, such as the naming, structure and format of data. For example, if Name of Student is a field in a table, it should be consistent everywhere.

- **Ensures data security**: The access to any record can be protected in a DBMS. The files can be accessed only by those who are authorised to do so.

- **Maintains integrity**: A DBMS maintains integrity by keeping some constraints when the data is entered. These constraints are rules designed to keep data consistent and correct. They act like a check on the incoming data.

> **FACT FILE**
>
> A relational database management system (RDBMS) was proposed by E.F. Codd in 1970. It is a type of database where data is organised as related tables. These databases are more powerful as relevant data can be extracted and tables extended and modified without having to reorganise the existing tables.

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Database objects

The following table identifies the database objects you can use while creating a Microsoft Access 2010 database:

Object	Description
Table	Stores information in the form of rows (records) and columns (fields). For example, one table could store a list of friends along with their details, while another table could store their exam marks.
Queries	These are used for sorting, grouping or filtering data in the database. For example, a query might only display a list of students in Class 7 out of all the school students.
Forms	Customised screens to provide an easy way to enter and view data in a table or query. For example, when you apply for admission in a school, you fill out an online form. The data that you enter in the admission form is stored inside the school's database.
Reports	These present the data from a table or query in a printed format. For example, teachers can create a report of all the students opting for Fine Arts as a subject.

ACTIVITY

A. Create a presentation on the topic 'Databases and their concepts'. The slides should include:

　1. Key features　　　2. History　　　3. Real-life usage

B. List the various types of database programs available along with their latest versions.

C. Think of a Hospital database. What do you think the table names might be in this database? Suggest the different fields of information in the tables. Draw the structure of this database using a software program of your choice.

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Starting MS Access 2010

Follow these steps to open the MS Access 2010 application.

1. Click on **Start** button ⟹ **All Programs** ⟹ **Microsoft Office** ⟹ **Microsoft Office Access 2010**.

2. MS Access 2010 window appears.

Creating a database
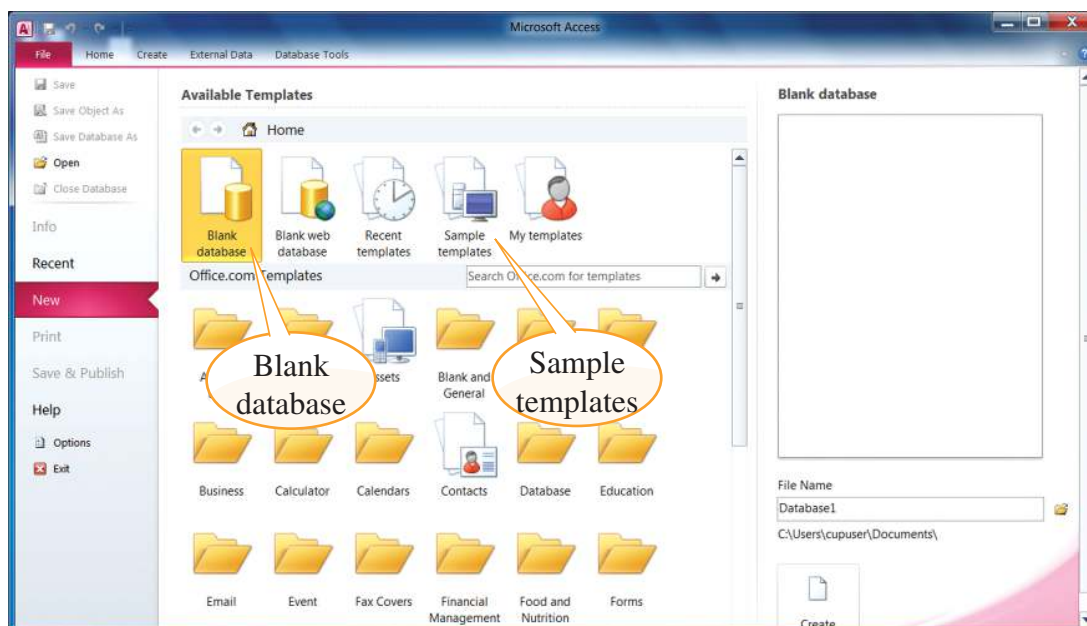
In MS Access 2010, a database can be created in two ways:

1. Using a blank database.

2. Using sample templates.

Using a blank database

To create a blank database, you need to follow the steps given below:

1. In the default MS Access window, a blank database is already selected. Also, the **Blank database** pane appears on the right.

2. Type a name for your database in the **File Name** box. The location of your database appears below this box.

> You can change the location of the database by clicking on the 📂 **Browse** icon in the right pane.
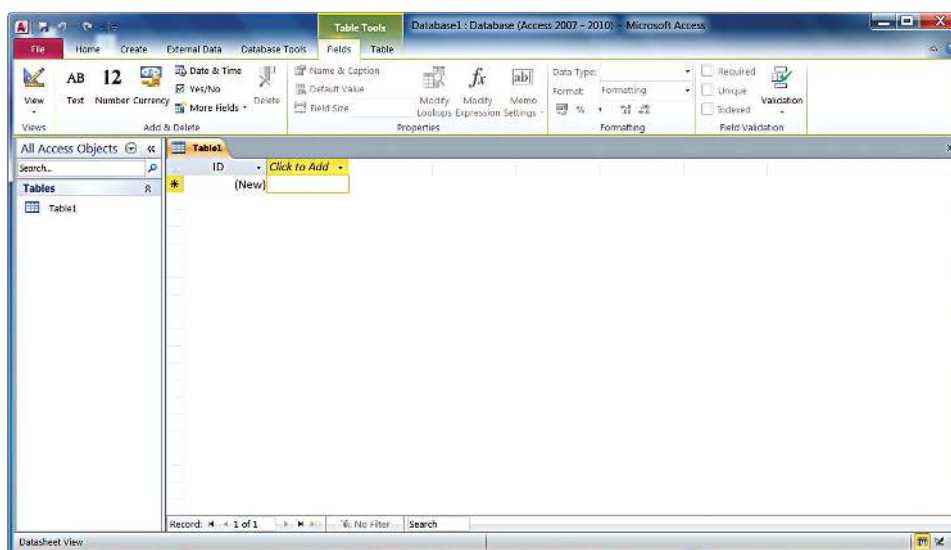

MS Access 2010 window

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3. Click on the **Create** button. A new database titled **Table1** will be created, as seen in the **Datasheet View** (see below). The table has a field labelled as **ID**. The header fields can be changed or added by double-clicking on it.
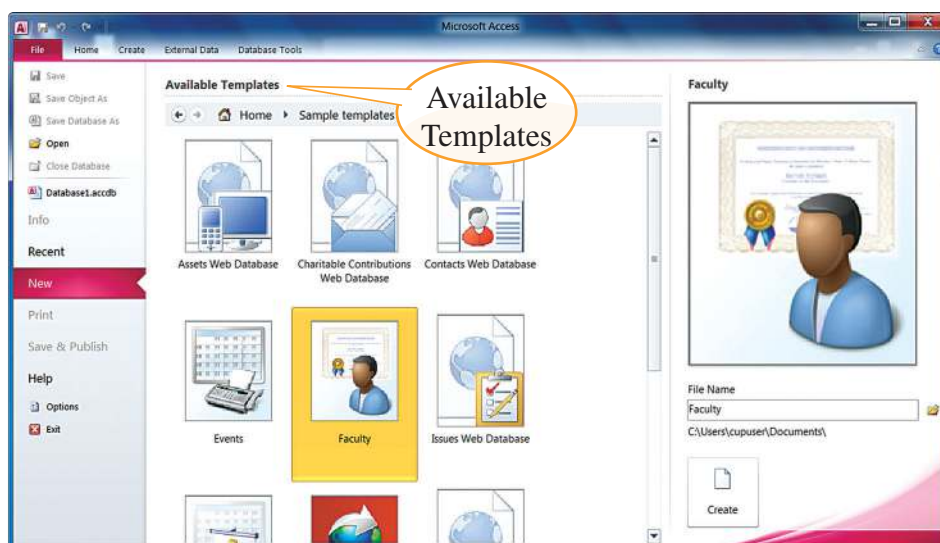
A new database using a blank database

Using sample templates

1. Click on the **Sample Templates** in the pane of the MS Access 2010 window.
2. Select the template of your choice, say Faculty, from the Available Templates section.

*Available Templates in the MS Access 2010 window*

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3. A pane appears on the right as shown on the previous page. Change the name of the file in the **File Name** box and change the location of the database using the Browse button. After clicking on the **Create** button in the right pane of the MS Access 2010 window, you will get the sample database Faculty List.
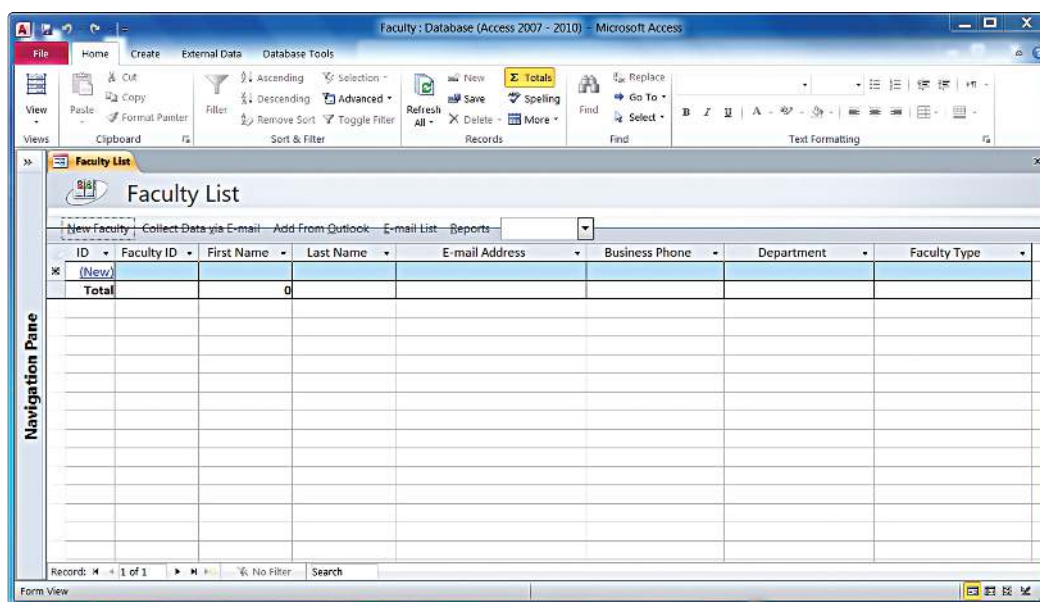
Creating a database using a template

Components of the MS Access 2010 window

The Database window has the components (parts) shown below.
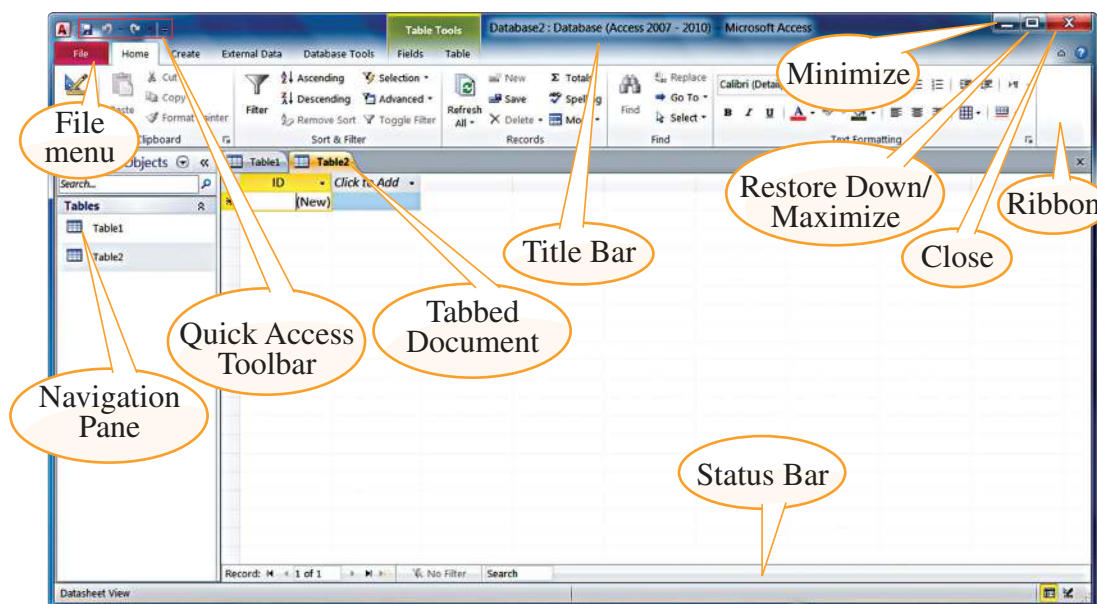
Components of a Database window

Title Bar: Shows the name of the database created. The **Minimize**, **Maximize/ Restore Down** and **Close** buttons are also found in this area.

File Menu: The button on the left of the Title Bar. It contains commands like New, Open, Save and Print.

Quick Access Toolbar: This has some of the most frequently used commands in MS Access like Save, Undo and Redo. The toolbar can be shifted below the Ribbon, and more commands can be added to it.

Ribbon: Contains the commands that can be performed on different database objects. These commands are classified under groups in different tabs.

Navigation Pane: The left pane of the window. Database objects in currently open or new databases are displayed.

Tabbed Document: The database objects appear in tabs, unlike the overlapping windows in the earlier versions.

Status Bar: This is found at the bottom of the window and displays the status and buttons to change the page views.

Data Types

The Data Type for every Field Name describes the form in which the data is accepted. Descriptions of some of the commonly used Data Type values that appear in the drop-down list are shown in the table below.

| Data Type	Description
AutoNumber	An integer that automatically generates an increasing or decreasing order of numbers when records are added or deleted. For example, the roll number of a student can be an AutoNumber.
Text	Stores alphanumeric values that is, both numbers and letters. Maximum 255 characters can be stored. For example, a product ID or an address.
Memo	Used for lengthy text and numbers such as definitions or descriptive notes. A maximum of 65,536 characters are allowed.
Number	Holds numeric data that is used for calculations. Both decimals and non-decimal digits are allowed.
Date/Time	Stores the date and time values in different formats.
Currency	Specifies different currencies and displays them in different formats.

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Yes/No	This can have only one of the two values True/False, Yes/No or On/Off.
Hyperlink	A link to an internet resource.

Commonly used Data Types in MS Access 2010

Setting Data Type

To set a data type for each field, follow the steps given below:

1. Select the chosen field you want to set the Data Type for.

2. Click on the **Fields** tab ⟹ **Formatting** group ⟹ **Data Type** drop-down list (see below). Select the chosen data type from the list. By default, AutoNumber is selected.
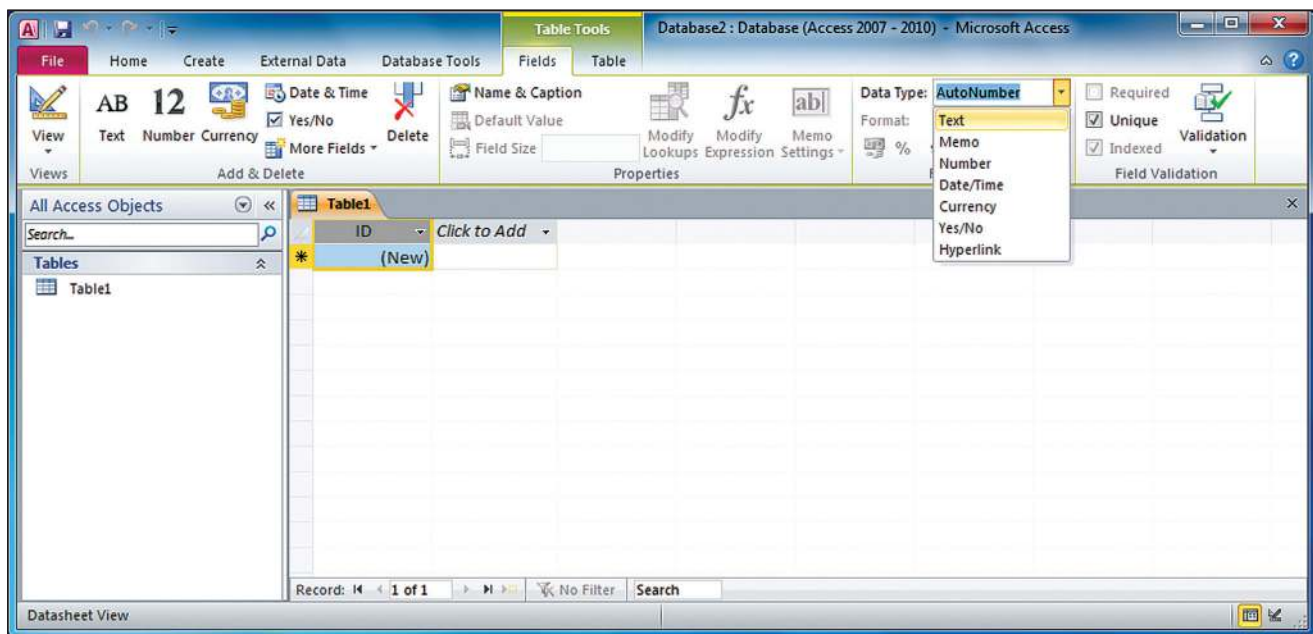
Setting Data Type

Primary Key

Every table in the database must have at least one field that uniquely identifies each record in the table. This field is known as the **Primary Key**. This key should always have a value that is not repeated for any other record.

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For example, in a table of students, it is possible that there are two students with the same name. Here, you can assign Admission No. as the primary key to identify each student.

If the primary key is not assigned, it is automatically added as an ID at the time of creating the table.
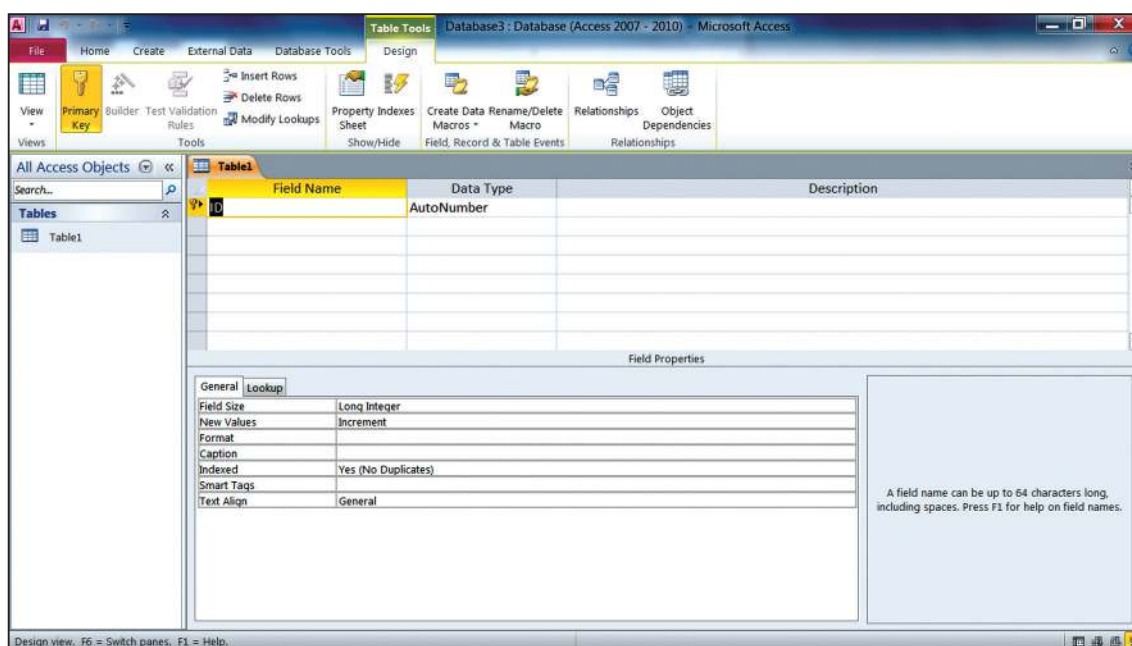
FACT FILE

You can have multiple primary keys for a table. However, these should be unique values. To do this you must hold down the Ctrl key and then select the row selector for each field.

Assigning a Primary Key

To access the **Design** tab, right-click on Table1 in the left pane, then select the **Design View** option.

To assign a primary key to the table fields, select the required field. For example, select the field and then click on the **Design** tab ⟹ **Tools** group ⟹ **Primary Key** option (see below).

Assigning a primary key