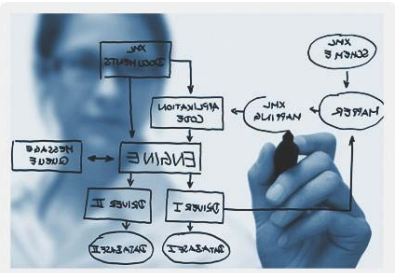
Unit 7: Database Development (Basic)



CONTENTS

Unit 7: Database Development (Basic)

SESSION 1: DATABASE CONCEPTS

Relevant Knowledge

A database is an organized collection of data. You can visualize it as a container of information. The data is typically organized to model relevant aspects of reality (for example, the availability of rooms in hotels), in a way that supports processes requiring this information (for example, finding a hotel with vacancies).

Suppose if you own a stationary shop, you need to keep detailed records of the materials available in your shop. You also need to store information about pricing, stock levels for reordering, old stocks, etc. While in the manual system, you would maintain several files with different bits of information; in the computerized system you would use database programs such as Microsoft Access, OpenOffice.org Base, and MySQL, to organize the data as per your business need.

The database concept has evolved since the 1960s to ease increasing difficulties in designing, building, and maintaining complex information systems (typically with many concurrent end-users, and with a large amount of diverse data).

In this lesson, you will learn database concepts and to work with a Database Management System (DBMS).

Database Management System

A database management system is a software package with computer programs that controls the creation, maintenance, and use of a database. It allows organizations to conveniently develop databases for various applications. A database is an integrated collection of data records, files, and other objects. A DBMS allows different user application programs to concurrently access the same database.

Well known DBMSs include Oracle, IBM DB2, Microsoft SQL Server, Microsoft Access, PostgreSQL, MySQL, FoxPro, and SQLite.

Data can be organized into two types:

- **Flat File:** Data is stored in a single table. Usually suitable for less amount of data.
- **Relational:** Data is stored in multiple tables and the tables are linked using a common field. Relational is suitable for medium to large amount of data.

Database Servers

Database servers are dedicated computers that hold the actual databases and run only the DBMS and related software. Typically databases available on the database servers are accessed through command line or graphic user interface tools referred to as Frontends; database servers are referred to as Back-ends. Such type of data access is referred to as a client-server model.

RDBMS

A relational database management system (RDBMS) is a database management system that is based on the relational model as introduced by E. F. Codd, of IBM's San Jose Research Laboratory. Most popular databases currently in use are based on the relational database model.

The relational model for database management is a database model based on first-order predicate logic, first formulated and proposed in 1969 by Edgar F. Codd. In the relational model of a database, all data is represented in terms of tuples, grouped into relations. A database organized in terms of the relational model is a relational database.

The purpose of the relational model is to provide a declarative method for specifying data and queries: users directly state what information the database contains and what information they want from it, and let the database management system software take care of describing data structures for storing the data and retrieval procedures for answering queries.

Database Concepts

Database contains objects that are used for storing and managing information. To understand a database in very simple language, let's look at the example of your address book. What do you store in an address book? You may have people's name, people's address, people's phone number and maybe even people's birthdays. There is a common element here – people. In this example, each person is considered an **"item"**. So, an item is what the database is storing information about. When you were recording information in your address book, what did you ask the people? What is your address? What is your phone number? etc. Each question that we ask about our item is a **"field"**. Now, say you make new friends and want to add their information to your address book. You will ask questions, get the answers and create a new **"record".** So a record is a set of information (made up of fields) stored in your database about one of the items. A **"value"** is the actual text or numerical amount or date that you put in while adding information to your database. When you put all the information together in a grid (like you do in a spreadsheet), a collection of similar records creates a table.

A database can have one or many tables. An address book example is a very simple one, in real life there are many more details involved. A big company would have in its database, one table for its products, one table for its suppliers, one table for its customer details, one for orders received and maybe many others. Basically each table in a database contains information about one type of item. So a database is basically *a container that holds tables and other objects and manages how they can be used.*

Another very important thing to remember is that when we put in information, we may have people with the same name (there can be more than one Charu Arora) or the same address (members of a family). But when creating a database an important feature is **record uniqueness** in every table. It is important to be able to distinguish between different items having duplicate values.

Uniqueness helps to avoid accidental duplication of records caused by user or computer error. This can be achieved by using some number or value that uniquely identifies a record. If such a unique value does not exist in your fields, as the database designer, you can create a special additional field in a table where unique numbers or values can be assigned for each new entry. Therefore, every table has a **key field** which ensures that there are 100% unique values throughout the database.

Every database table should have one or more fields designated as key. You can assign a unique value to this key for differentiating records that may have similar names or address. Look at the following example of student database:

Name	Standard	Section
Ram	X	A
Ravi	X	A
Ravi	X	A
Sanjay	X	B

In this table, it will be extremely difficult to differentiate between student records as they have names that are similar. To differentiate, you can add additional field - roll number - that will be unique for each record (example below).

Rollno	Name	Standard	Section
19	Ram	X	A
20	Ravi	X	A
21	Ravi	X	A
22	Sanjay	X	B

EXERCISE

Perform the following activities till you are confident:

S.No.	Activities
1.	Analyze database requirements for a retail shop. Record the business requirements and document. (You can use this information for creating a database to suit this business requirement)
2.	Analyze database requirement for your school; visit different departments such as library, student admission centre, to gather requirements. Document the business requirement. (You can use this information for creating a database to suit this requirement

ASSESSMENT

Short Answer Questions

1. What does DBMS stands for?
2. What does RDBMS stands for?
3. How is data organized in a RDBMS?

Fill in the blanks:

1. A _____ is an organized collection of data.
2. A _____ is a software package that can be used for creating and managing databases.
3. A _____ is a database management system that is based on the relational model.
4. Three popular DBMS software are _____, _____, & _____.

SESSION 2: DATA STORAGE

Relevant Knowledge

Data in a relational database management system (RDBMS) is organized in the form of tables. You will now quickly recap what you learnt in the last session and assimilate more concepts.

Tables:

A table is a set of data elements (values) that is organized using a model of vertical columns (which are identified by their name) and horizontal rows. A table has a defined number of columns, but can have any number of rows. Each row is identified by the values appearing in a particular column identified as a unique key index or the key field.

Columns or Fields:

A column is a set of data values of a particular simple type, one for each row of the table.

The columns provide the structure according to which the rows are composed. For example, cFirstName, or cLastName are fields in a row.

Rows or Records or Tuples:

A row also called a record or tuple represents a single, data item in a table. In simple terms, a database table can be visualized as consisting of rows and columns or fields. Each row in a table represents a set of related data, and every row in the table has the same structure.

Data types:

Datatypes are used to identify which type of data (value) we are going to store in the database. Fields themselves can be of different types depending on the data they contain. Data types in OpenOffice base is broadly classified into five categories listed below.

- Numeric Types
- Alphanumeric Types
- Binary Types
- Date time
- Other Variable types

Numeric Types:

Numeric data types are used for describing numeric values for the field used in the table of a database. Numeric data types in a database can be using for storing information such as mobile number, roll number, door number, year of school admission, true or false statements, statistical values, etc. The different types of numeric data types available are listed here.

Name	Data type	Description
BOOLEAN	Yes / No	Values as 0 or 1. Example: True or False, Yes or No.
TINYINT	Tiny Integer	Store integer range between 0 to 255
SMALLINT	Small Integer	Store integer range between -2^{15} to $+2^{15}-1$
INTEGER	Integer	Store integer range between -2^{31} to $+2^{31}-1$
BIGINT	Big Integer	Range between -2^{63} to $+2^{63}-1$
NUMERIC	Number	Maximum precision of $e^{(+/-)231}$
DECIMAL	Decimal	Maximum precision of $e^{(+/-)231}$
REAL	Real	2^{-1074} to $(2-2^{-52})* 2^{1023}$
FLOAT	Float	2^{-1074} to $(2-2^{-52})* 2^{1023}$
DOUBLE	Double	2^{-1074} to $(2-2^{-52})* 2^{1023}$

Alphanumeric Types:

Name	Data type	Description
LONGVARCHAR	Memo	Stores up to the max length or number indicated by user. It accepts any UTF 8 Character.
CHAR	Text (fix)	Stores exactly the length specified by user. Pads with trailing spaces for shorter strings. Accepts any UTF 8 Character.
VARCHAR	Text	Stores up to the specified length. No padding (Same as long var char)
VARCHAR_IGNORE CASE	Text	Stores up the specified length. Comparisons are not case sensitive but stores capitals as you type them.

Binary Types:

Binary data types are used for storing data in binary formats. Binary data types in a database can be using for storing photos, music files, etc. In general, files of any format can be stored using the binary data type. The different types of binary data types available are listed here.

Name	Data type	Description
LONGVARBINARY	Image	Stores any array of bytes (images, sounds, etc.). No validation required.
BINARY	Binary (fix)	Stores any array of bytes. No validation required.
VARBINARY	Binary	Stores any array of bytes. No validation required.

Date time:

Date time data types are used for describing date and time values for the field used in the table of a database. Date time data types in a database can be using for storing information such as date of birth, date of admission, date of product sale, etc. The different types of date time data types available are listed here.

Name	Description	Format
Date	Stores month, day and year information	1/1/99 to 1/1/9999
Time	Stores hour, minute and second info	Seconds since 1/1/1970
Timestamp	Stores date and time information	

Other Data Types:

Name	Description	Format
Other/Object	Stores serialized Java objects â€“ user application must supply serialization routines	

You had used the example of an address book in the previous lesson. An address book uses only one table. But look at a different situation. If you are a dealer selling a single type of item and want to record details of your sales in the past month and also want the details of the client who purchased the item (name, address, phone, date purchased, number of items bought etc), what would you do?. You create a table Sales with all the details:

OrderID	Customer Name	Customer Address	Phone	Sale Date	#ItemsBought
000789	Sheela Arora	xxxxxxNoida	2444490	01/11/12	3
000790	Vaibhav Mittal	xxxxGhaziabad	2443358	01/11/12	4
000791	Saurabh Tayal	xxxxNew Delhi	2678945	02/11/12	12
000792	Vaibhav Mitttal	xxxxGhaziabad	2443258	02/11/12	23
000793	Prashant Singh	xxxxRohtak	6784534	02/11/12	4
000794	Shila Arora	xxxxxxNoida	2444490	03/11/12	18
000795	Vaibhav Mittal	xxxxGhazibad	2443258	03/11/12	45

Do you see a problem here? Every time you sell an item to Sheela or Vaibhav or any other customer (client) you need to store the details again. So, what is the solution? Create one table for client details and another for sale details. Since each record has to be unique, you can insert a ClientID field to uniquely identify each client in the client table. In the Sales table, you would give a point of reference which “points” to a particular record in the Client table.

In the example here, the field ClientID occurs once in the Client table, but since one client can place many orders, it occurs a number of times in the Sales table. Since we cannot have an order without a customer, we call Client the **parent** and Sales the **child** table. Related tables like these share a common field. You store data about people once, but refer to those people many times in the database.

This unique field is called the **primary key (PK).** *A primary key is a unique value that identifies a row in a table.* In our example, ClientID is the primary key in the Client table. Primary Keys are also indexed in the database, making it faster for the database to search for a record.

The referred field ClientID which occurs in the Sales table is called the **foreign key (FK).** Hence, the foreign key identifies a column or set of columns in one (referencing) table that refers to a column or set of columns in another (referenced) table. The “one” side of a relation is always the

Client Table

ClientID	Name	Address	Phone
0000001	Sheela Arora	xxxxxxNoida	2444490
0000002	Vaibhav Mittal	xxxxGhaziabad	2443358
0000003	Saurabh Tayal	xxxxNew Delhi	2678945
0000004	Prashant Singh	xxxxRohtak	6784534

Primary Key

One client, three orders for that client.

Sales Table

OrderID	ClientID	SaleDate	#ItemsBought
000789	0000001	01/11/12	3
000790	0000002	01/11/12	4
000791	0000003	02/11/12	12
000792	0000002	02/11/12	23
000793	0000004	02/11/12	4
000794	0000001	03/11/12	18
000795	0000002	03/11/12	45

Primary Key

parent, and provides the PK attributes to be copied. The "many" side of a relation is always the child, into which the FK attributes are copied. *Memorize it: one, parent, PK; many, child, FK.*

Another point to remember is that the end users will/may never have direct access to the database. They can only see what you permit them to and can select only from the options you give them.

EXERCISE

Perform the following activities till you are confident:

S.No.	Activities
1.	Create a database for a stationery shop. Hint : Create fields for items, price, color, vendor, etc.

ASSESSMENT

Short Answer Questions

1. List the data types used in a DBMS /RDBMS?
2. State the relationship and difference between a primary and foreign key?
3. List datatypes available in Numeric Datatype.
4. List datatypes available in Alphaumeric Datatype.
5. List datatypes available in Numeric Datatype.
6. List datatypes available in Data Datatype.

Fill in the blanks:

1. A _____ is a set of data elements that is organized using a model of vertical columns and horizontal rows.
2. A _____ is a set of data values of a particular simple type, one for each row of the table.
3. A _____ represents a single, data item in a table.
4. _____ are used to identify which type of data we are going to store in the database.
5. A _____ is a unique value that identifies a row in a table.

SESSION 3: MANIPULATING DATA

Relevant Knowledge

In a database you can define the structure of the data and manipulate the data using some commands. There are two types of languages for this task. These are:

- Data Definition Language (DDL)
- Data Manipulation Language (DML)

Data Definition Language (DDL)

A data definition language or data description language (DDL) is a standard for commands that define the different structures in a database. DDL statements create, modify, and remove database

objects such as tables, indexes, and users. Common DDL statements are CREATE, ALTER, and DROP.

Data Manipulation Language (DML)

A data manipulation language (DML) is a language that enables users to access and manipulate data in a database. The goal is to provide efficient human interaction with the system. Data manipulation involves:

- Retrieval of information from the database- SELECT statement
- Insertion of new information into the database - INSERT statement
- Deletion of information in the database - DELETE statement
- Modification of information in the database - UPDATE statement

A query language is a part of DML involving information retrieval only. The terms DML and query language are often used synonymously.

A popular data manipulation language is Structured Query Language (SQL). This is used to retrieve and manipulate data in a relational database. Other forms of DML are those used by IMS/DLI, CODASYL databases, such as IDMS and others. Data manipulation language comprises the SQL data change statements, which modify stored data but not the schema or database objects.

There are two types of DML:

- **Procedural:** The user specifies what data is needed and how to get it
- **Nonprocedural:** The user only specifies what data is needed. This is easier for the user but may not generate code as efficient as that produced by procedural languages.

ASSESSMENT

Fill in the blanks:

1. Types of languages used for creating and manipulating the data in the Database are _____ & _____.
2. A _____ is a standard for commands that define the different structures in a database.
3. A _____ is a language that enables users to access and manipulate data in a database.
4. A _____ is a part of DML involving information retrieval only.
5. A popular data manipulation language is _____.
6. Common DDL statements are _____, _____ and _____ .

SESSION 4: CREATING A DATABASE OBJECT

Relevant Knowledge

There are a variety of DBMS/RDBMS available; in this exercise, you will learn about OpenOffice Base an Open Source RDBMS.

Launching Openoffice

- To launch OpenOffice, click ***Start>Programs>OpenOffice.org 3.4.1>OpenOffice.org.*** Alternatively, you can also double-click on the OpenOffice.org 3.4.1 shortcut on the desktop if available. You should see a Window similar to the one displayed below

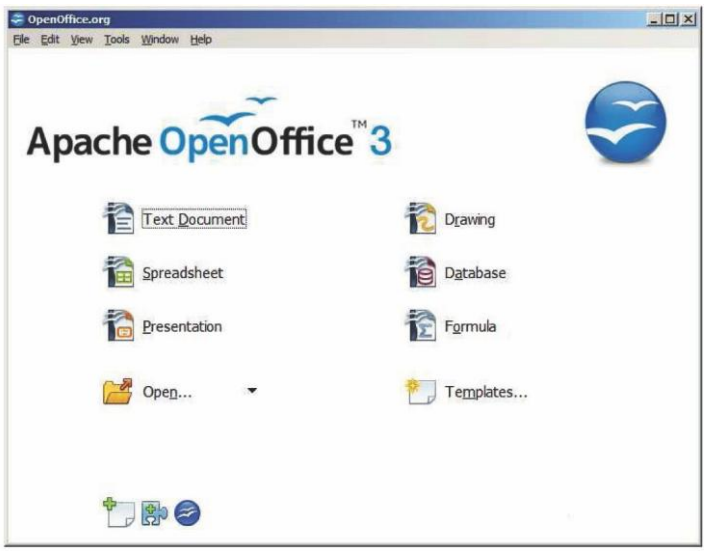


Figure 1

Select the option database to launch the base application.

You can also directly launch the OpenOffice Base Application by doing the following:

- Click ***Start>Programs>OpenOffice.org 3.4.1>OpenOffice.org Base.*** You should are guided through the Database Wizard for creating a database. You will see a dialog box similar to the one displayed below.

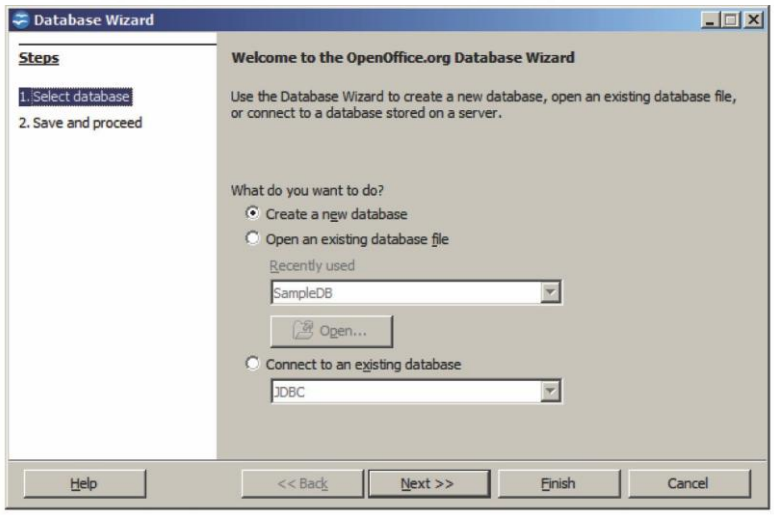


Figure 2

You can create a new database by selecting the option ***Create a new database.***

You can also open an existing database file that you have already created by selecting the option ***Open an existing database file.***

Click ***Next.*** A dialog box similar to the one displayed below appears.

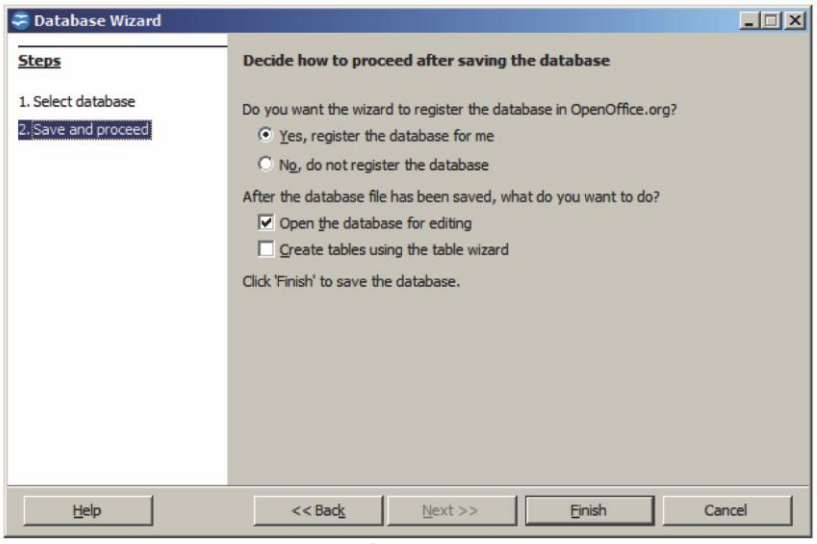


Figure 3

Click ***Finish.*** The ***Save As*** dialog box appears as shown below.

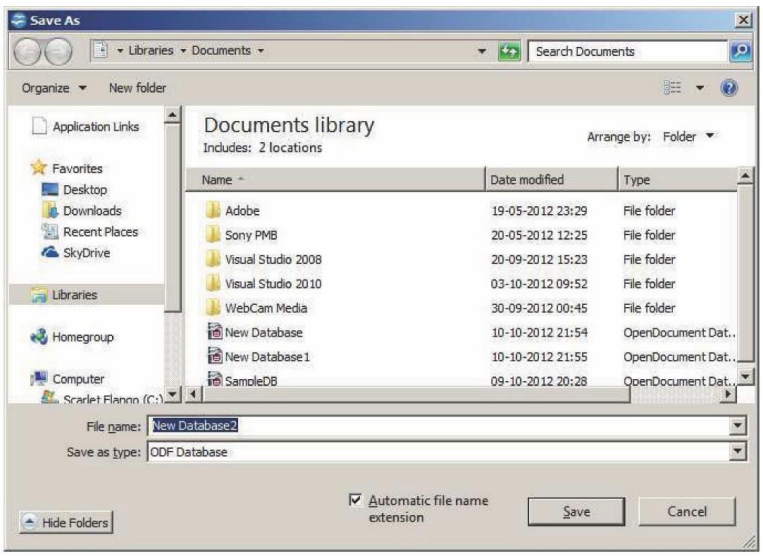


Figure 4

Specify a name for the database in the ***File name:*** field and click ***Save.*** A window similar to the one displayed below.

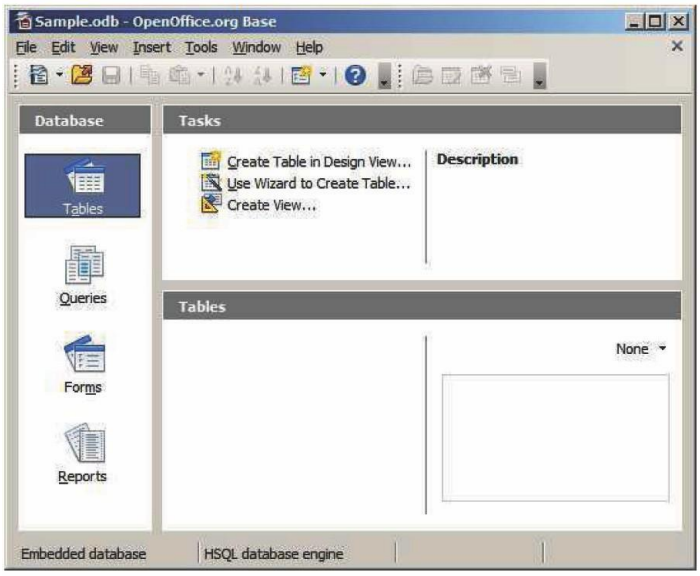


Figure 5

Now that you have created a database, you can work with the database as outlined in the next few sessions.

EXERCISE

Perform the following activities till you are confident:

S.No.	Activities
1.	Create a database

ASSESSMENT

Short Answer Questions:

1. What is the file extension for databases created using OpenOffice.Org Base?
2. List any three file formats that can be managed using OpenOffice.Org Base?

SESSION 5: CREATING A TABLE

Relevant Knowledge

Tables are the basic building blocks of a database. You store the data in the database in the form of tables. In the previous exercise you have learnt how to create database objects in OpenOffice.

In this exercise you will learn how to create a table in a database.

After creating the database, you see a window as shown below.

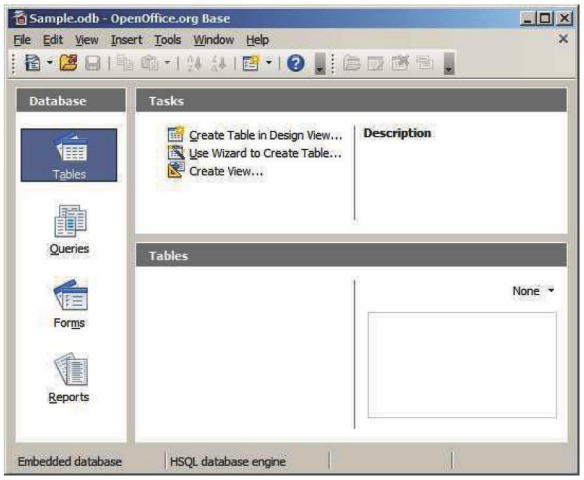


Figure 6

Click on ***Create Table in Design View…*** option available under Tasks and a ***Table Design*** window appears as shown below.

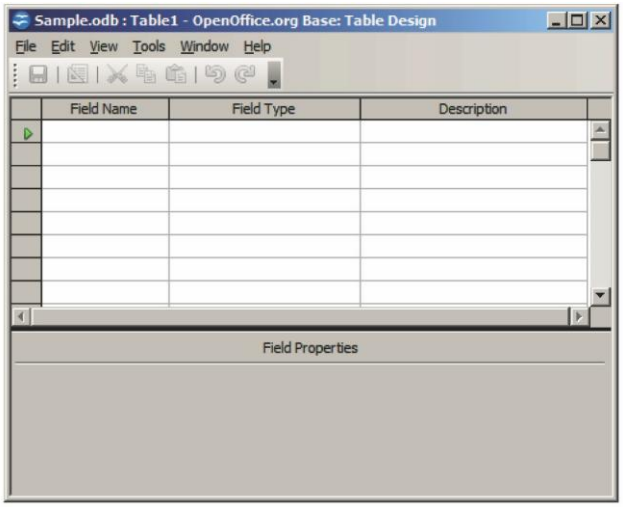


Figure 7

Specify the field name and data type of the field to be created by selecting the appropriate type available under Field type dropdown list.

Now create a table with the following fields displayed below:

Specify the field name and the data type for each field name. For example, the table contains Name field and the data type of the Name is TEXT [VARCHAR]. You can specify the length of the field value.

Field Name	Data type	Length
Name	VARCHAR	50
Rollno	TINYINT	3
DOB	Date	DD/MM/YY
Class	Char	1
Phone	INTEGER	10
Email	VARCHAR	75
Color	VARCHAR	15
Location	VARCHAR	30

After specifying the field name and data type for the field variables, save the table by clicking on ***File>Save*** shown below.

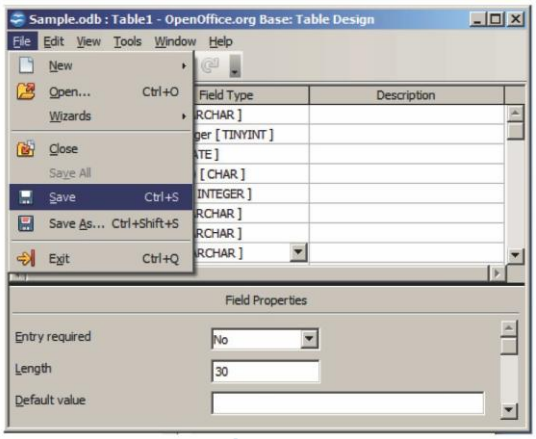


Figure 8

Specify the table name. The default name is Table1. Click **OK.**

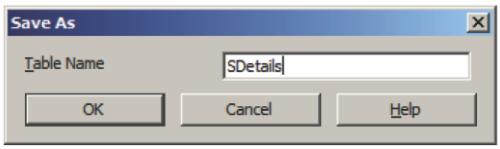


Figure 9

A dialog box appears, similar to the one displayed below.

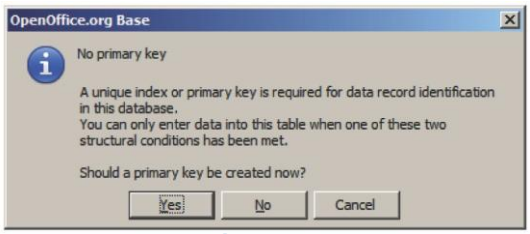


Figure 10

You are asked to set a primary key for the table you just created. You can select the appropriate option to set the primary key or leave the table without a primary key.

If you click ***Yes,*** the application will set the primary key for the first field created automatically. If you click ***No,*** you should see a window similar to the one displayed below.

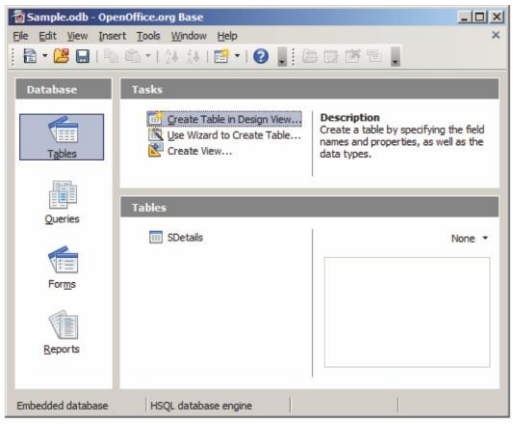


Figure 11

Notice the table by the name SDetails created and visible under Tables section.

Create the following records:

Create the following records:

Name	Rollno	DOB	Class	Phone	Email	Color	Location
Ravi Kaul	23	13/08/99	X	123456	ravikaul@gmail.com	Blue	Delhi
Bijendar Dalal	13	15/01/99	X	567889	dalal@gmail.com	Green	Mumbai
Radha Swami	7	01/02/00	X	234353	radhasw@gmail.com	Orange	Gujarat
Vikas Maheswari	32	17/11/98	X	233445	vikawari@gmail.com	Blue	Maharashtra
Vimla Rani	14	23/09/99	X	242526	vimla99@gmail.com	Yellow	Orissa
Sandhya Reddy	26	19/12/98	X	213141	sandhyared@gmail.com	Blue	Delhi

To insert values into the table, just double-click the table name, you should see a window similar to the one displayed below.

Figure 12

Start typing the records in the table with the data provided in the excel sheet and select ***File > Savecurrent record*** to save data in the table.

EXERCISE

Perform the following activities till you are confident:

S.No.	Activities
1.	Create a table and enter data in it
2.	Create a database to store your academic records using the guidelines below: • Use your roll number as the file name for your database. • Create fields such as subject name, required score, passing score and your percentage. • Set the subject name field as the primary key. Populate your database with your most recent exam results.

ASSESSMENT

Fill in the blanks:

1. _____ are the basic building blocks of a database.

2. To design a table, you need to select _____ _____ in _____ _____ option available under Task.

SESSION 6: BUILDING FORMS

Relevant Knowledge

A form provides the user a systematic way of storing information into the database. It is an interface in a user specified layout that lets users to view, enter, and change data directly in database objects such as tables.

In this exercise, you will learn to create a form.

To create a form, Click on ***Forms*** option located under Database section (Figure below).

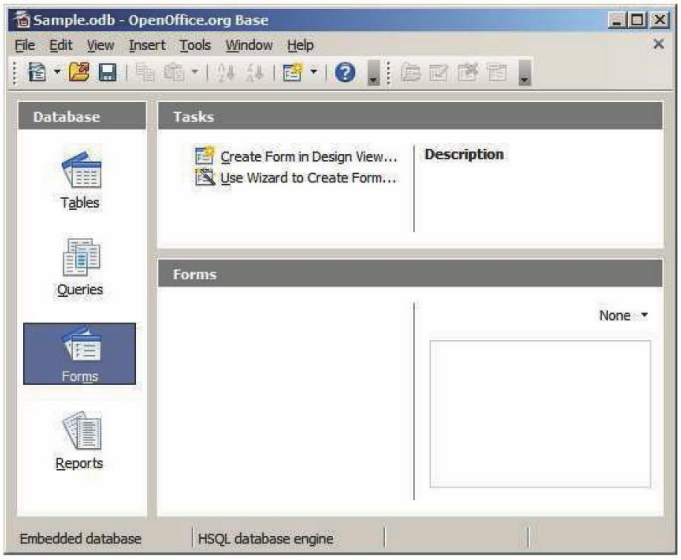


Figure 13

Click ***Use Wizard to Create Form…*** option under **Tasks** group. The Form Wizard dialog box appears as shown below.

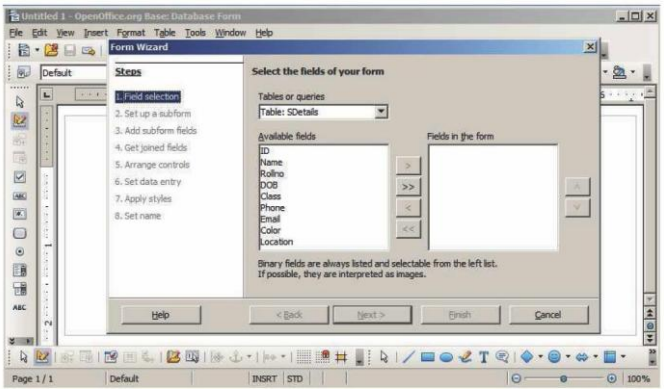


Figure 14

You can select selective fields to be sent onto the form by selecting the field name and clicking > button. You can select individual fields in a database or all fields in a database.

To use all the fields in the table in a form, click the >> button.

Notice the fields displayed under **Fields in the forms** section (Figure below).

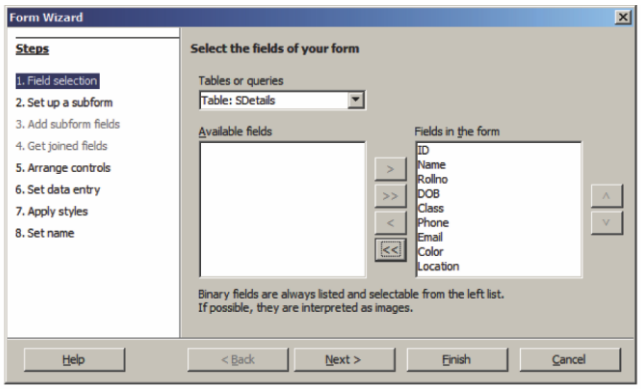


Figure 15

Click ***Next>.*** You see the ***Set up a sub form*** step dialog box of the wizard as shown below.

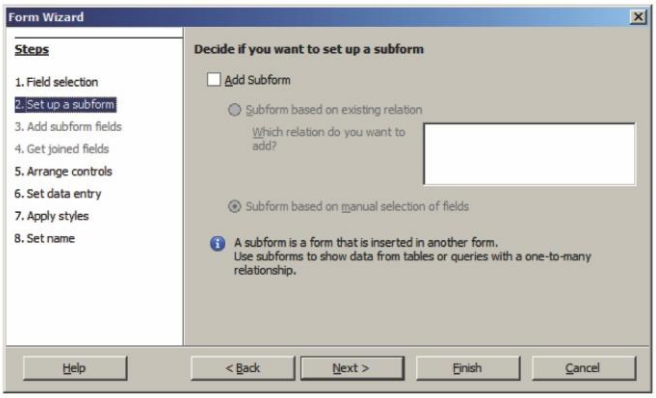


Figure 16

You can select the option ***Add Subform*** if you need to insert the contents in the table in a separate form. Click ***Next>.***

Now you need to arrange selected fields in a form. You can use different styles from the list displayed below:

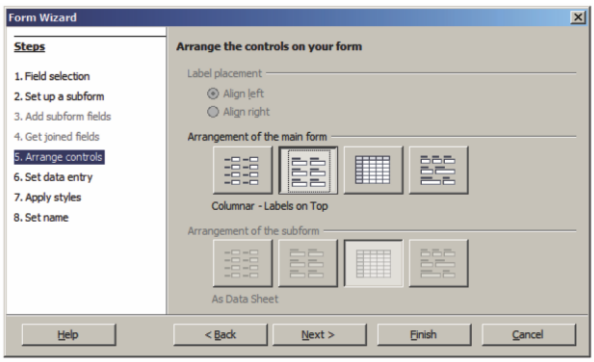


Figure 17

Once you have selected a style, click **Next >**

A dialog box appears wherein you can select the data entry model.

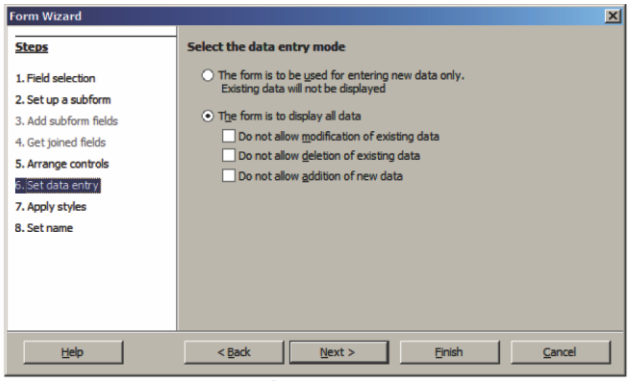


Figure 18

Click ***Next >.*** You should see a dialog box wherein you can specify the styles to be used in the form.

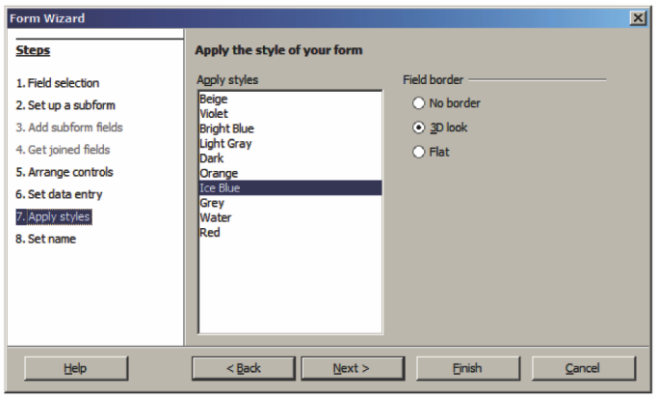


Figure 19

Click ***Next >.*** You see a dialog box where you can specify the name of the form. Click **Finish.**

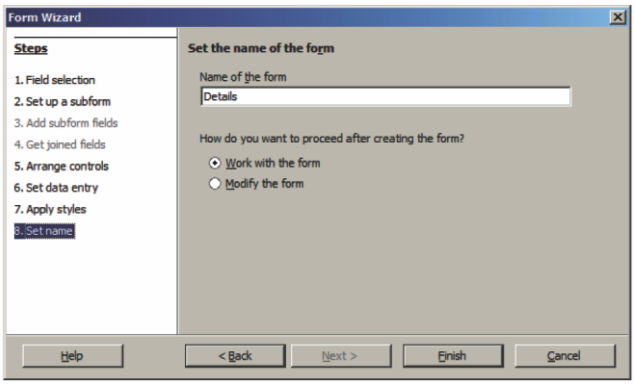


Figure 20

A form window appears. Notice that the records in the table are displayed automatically within the form that you just created.

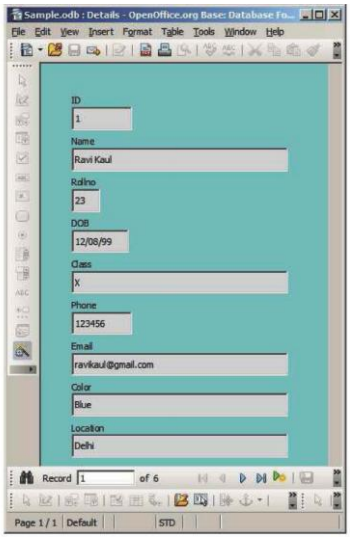


Figure 21

You can add new records to the table using the form by clicking the  symbol located at the bottom as shown below.

Figure 22

Once you click the  symbol, you will be displayed with a window for creating records (Figure below).

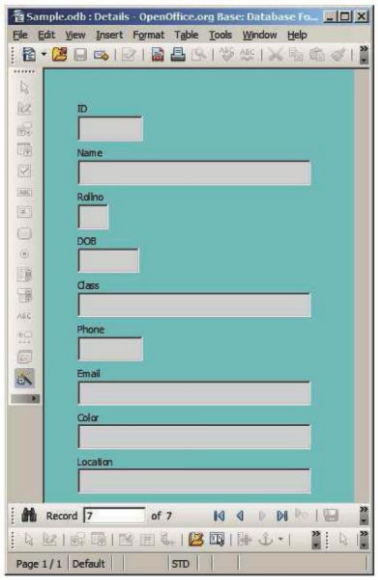
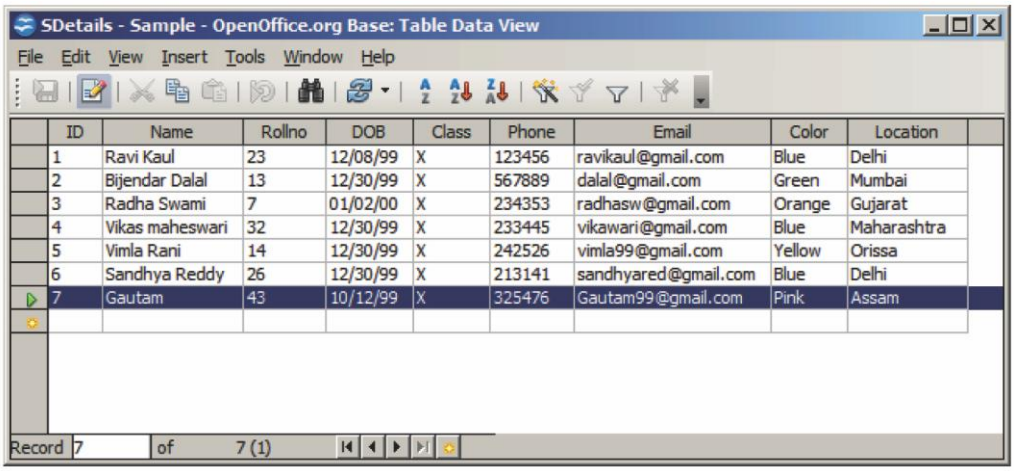


Figure 23

You have learnt to create records using design view in the earlier sessions. You can add records using the form as displayed below. Type the following data in the textbox provided in the box as shown below:

Name	Gautam
Rollno	43
DOB	10/12/99
Class	X
Phone	325476
Color	Pink
Email	gautam43@gmail.com
Location	Assam

To view the saved records, Double-click **SDetails** (Table name) under Tables section. A window similar to the one below will be displayed; notice the record that you created using a form is also displayed along with other records (Figure below)



ID	Name	Rollno	DOB	Class	Phone	Email	Color	Location
1	Ravi Kaul	23	12/08/99	X	123456	ravikaul@gmail.com	Blue	Delhi
2	Bijendar Dalal	13	12/30/99	X	567889	dalal@gmail.com	Green	Mumbai
3	Radha Swami	7	01/02/00	X	234353	radhasw@gmail.com	Orange	Gujarat
4	Vikas maheswari	32	12/30/99	X	233445	vikawari@gmail.com	Blue	Maharashtra
5	Vimla Rani	14	12/30/99	X	242526	vimla99@gmail.com	Yellow	Orissa
6	Sandhya Reddy	26	12/30/99	X	213141	sandhyared@gmail.com	Blue	Delhi
7	Gautam	43	10/12/99	X	325476	Gautam99@gmail.com	Pink	Assam

Figure 24

Now enter three more records using the form and view them using the above mentioned procedure.

EXERCISE

Perform the following activities till you are confident:

S.No.	Activities
1.	Create a form
2.	Enter data in a table using a form
3.	Create a form for the academic database created in the earlier session. Populate the academic database with mark results using the form.

ASSESSMENT

Fill in the blanks:

1. A _____ helps the user to systematically store information in the database.
2. A _____ enables users to view, enter, and change data directly in database objects such as tables.
3. To create a form you need to select _____ option available under Database section.

SESSION 7: CREATE AND MANAGE QUERIES

Relevant Knowledge

Having created the tables and entering data into them, now you want to extract some information. That's when you query the database. As the name suggests, query is to collect specific information from the pool of data. A query helps us join information from different tables and filter that information. ***Filtering*** means that the query uses criteria you provide it to hide some data and present only what you want to see.

Some RDBMS provide a graphical means to create queries, but most RDBMS do not do so. That's where you use SQL (pronounced as "sequel") or Structured Query Language. Query languages are computer languages used to make queries into databases and information systems. Queries are commands that are used to define the data structure and also to manipulate the data in the database.

A SELECT statement retrieves zero or more rows from one or more database tables or database views. In most applications, SELECT is the most commonly used Data Manipulation Language (DML) command.

The SELECT statement has many optional clauses:

- WHERE specifies which rows to retrieve.
- ORDER BY specifies an order in which to return the rows.

To retrieve all the columns in a table the syntax is:**SELECT * FROM <TABLENAME>;**

In order to execute queries click on the **Queries** option available on the left side under database section, click ***Create Query in SQL View*** as shown below.

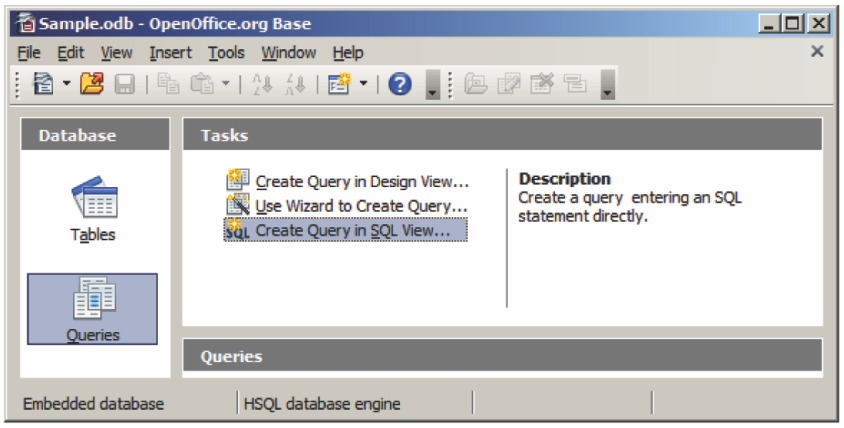


Figure 25

A window appears similar to the one displayed below.

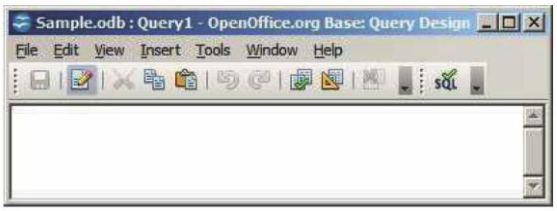


Figure 26

You can type the query in the above window and execute it by using the F5 function key or by clicking the icon in the window.

For example, if you want to display all the data in the table that you created in the early session, then the select statement will be: ***select * from SDetails;***

After executing the select query the output will be shown similar to the one displayed below.

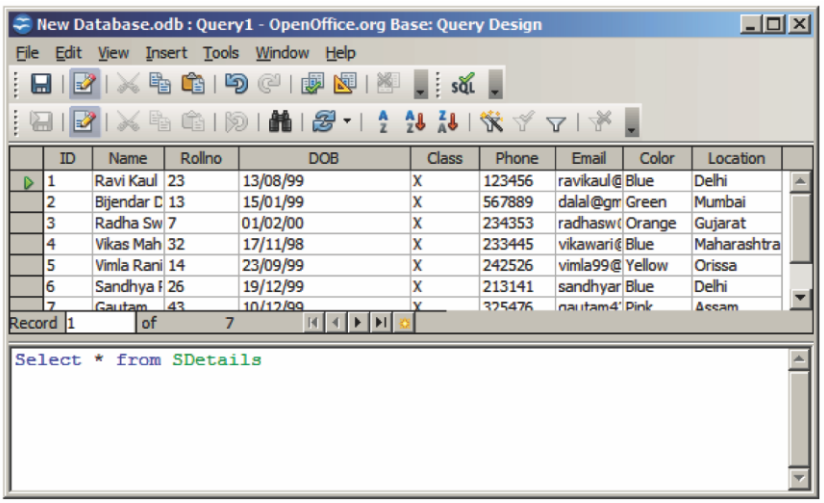


Figure 27

To get details about the list of students whose favorite color is blue, you can use:

select * from SDetails where Color='Blue';

After executing the select query the output will be shown similar to the one displayed below.

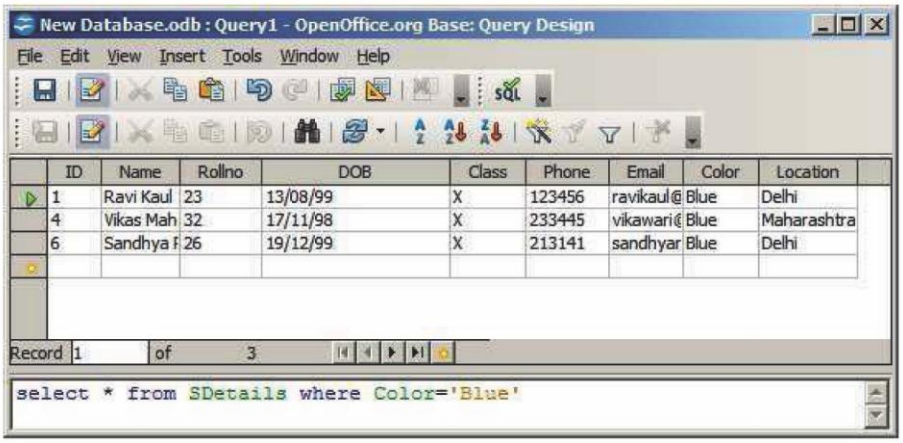


Figure 28

To view records in ascending order of RollNo, from the table the select statement will be:

select * from SDetails order by "Rollno" ASC;

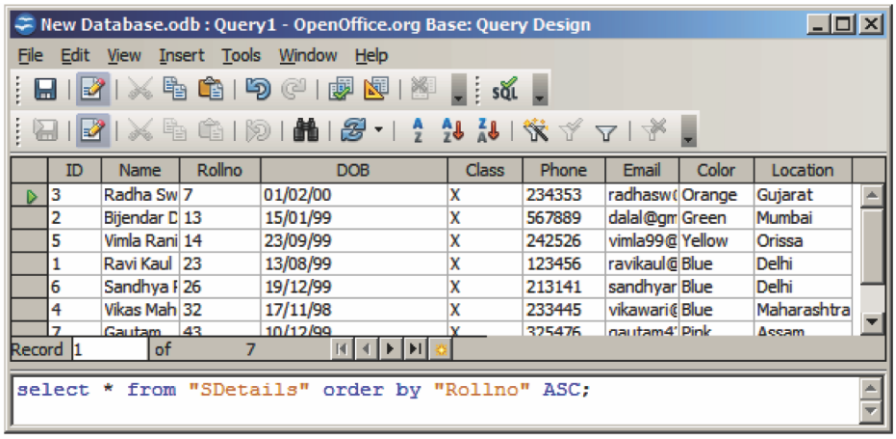


Figure 29

You can add, modify or delete records using the **Insert, Update and Delete** commands.

To type and execute SQL commands, click on ***Tools > SQL.*** A window similar to the one below will be displayed.

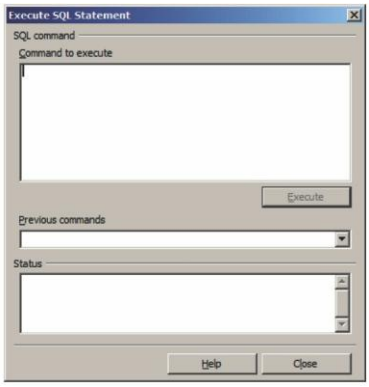


Figure 30

You can type the SQL Commands in the ***Command to execute*** space and click on Execute.

INSERT statement

INSERT statement is used to add one or more records to a database. The general syntax of the insert statement is shown below.

INSERT INTO <table_name><column1, column2, column3...> VALUES <value1, value2, value3 ...>;

To add a record in the database created earlier, type the following and click Execute.

insert into SDetails ("ID", "Name", "Rollno", "DOB", "Class", "Phone", "Email", "Color", "Location") values ('8', 'Ranjith Singh', '67', '12-03-99','X', '435363', 'ranjth99@gmail.com', 'White', 'Bihar');

After inserting the data into the table, use select query to view the updated table. After execution you should see a window similar to the one displayed below.

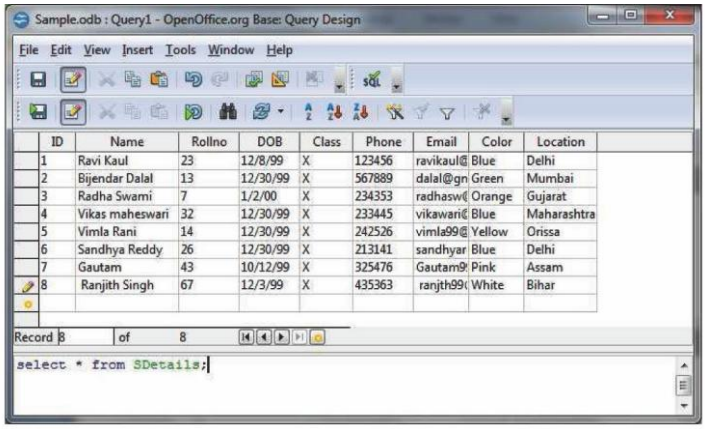


Figure 31

UPDATE statement

Update statement is used for modifying records in a database. The general syntax of the update statement is as follows:

UPDATE <table_name> SET <column_name> = value [, column_name = value ...] [WHERE <condition>]

To update a record using update statement, type the following and click Execute.

update SDetails set Location = 'Bhubaneswar' where Rollno = 14;

Execute select query to view the updated table. After execution you should see a window similar to the one displayed below.

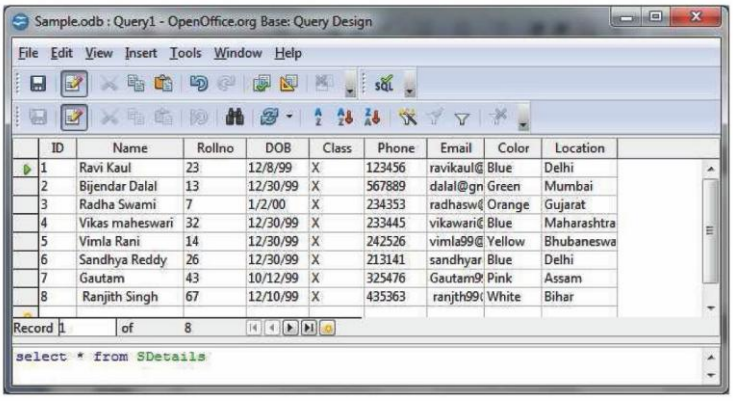


Figure 32

DELETE statement

Delete Statement is used to remove one or more records in a database. The general syntax of the delete statement is as follows:

DELETE FROM <table_name> [WHERE] <condition>;

To delete one of the records in the table created earlier using delete statement, type the following and click ***Execute:***

delete from SDetails where ID=8;

Execute select query to view the updated table. After execution you should see a window similar to the one displayed below.

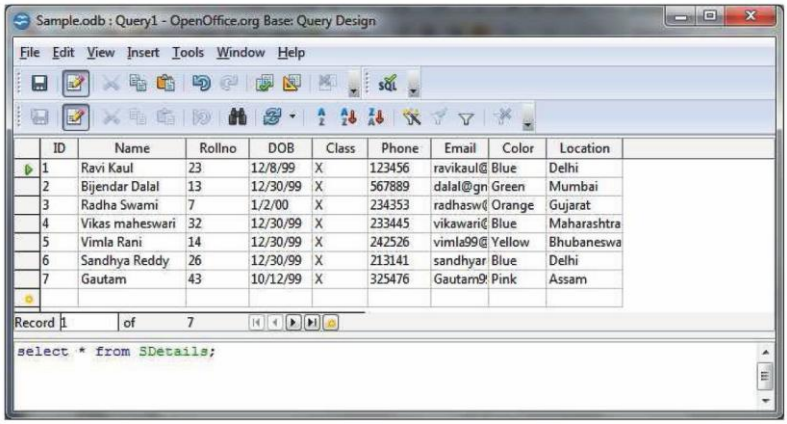


Figure 33

Notice the record with the Roll No 8 is deleted from the database.

CREATE Statement

Create statement is used for creating a database or a table in any RDBMS Software. A commonly used CREATE command is the CREATE TABLE command. The general syntax of the create statement is shown below.

CREATE TABLE <TABLENAME> ([column definitions]) [table parameters]

Column definitions: A comma-separated list consisting of any of the following

Column definition: [column name] [data type] {NULL | NOT NULL} {column options}

Primary key definition: PRIMARY KEY ([comma separated column list])

For example, if you would like to create a table using the Create statement, type the following and click Execute.

```
CREATE TABLE Employee (ID INTEGER, Name VARCHAR (50),
                       Department VARCHAR (50),
                       Address VARCHAR (120),
                       Contact_Number INTEGER);
```

Now create 5 records in the table and use the SQL statements to view, modify and delete them.

EXERCISE

Perform the following activities till you are confident:

S.No.	Activities
1.	Open the academic database created in the previous sessions.
2.	Use the select query statement to query and sort on subjects marks scored was greater than 50%.
3.	Create a database for a school library.
	Hint : Create fields for book title, cost, provider, availability, etc
4.	Create a database for maintaining a song collection.
	Hint : Create fields for fields such as artist, movie, year released, etc.
5.	Create a database for collecting and maintaining census data.
	Hint : Create fields for fields such as First Name, Last Name, DOB, Place of birth, Employment Status, etc.

ASSESSMENT

Fill in the blanks:

1. A _____ is helps to collect specific information from the pool of data in the database.
2. _____ statement retrieves zero or more rows from one or more database tables or database views.
3. _____ statement is used to add one or more records to a database.
4. _____ statement is used for modifying records in a database.
5. _____ statement is used to remove one or more records in a database.
6. _____ statement is used for creating a database or a table in any RDBMS Software.

SESSION 8: DESIGN REPORTS

Relevant Knowledge

A report is used to generate the overall work outcome in a clear format. You can also create reports in database.

Click on Reports section under Database in the OpenOffice base application.

Once you select the option, you should see a window similar to the one displayed below.

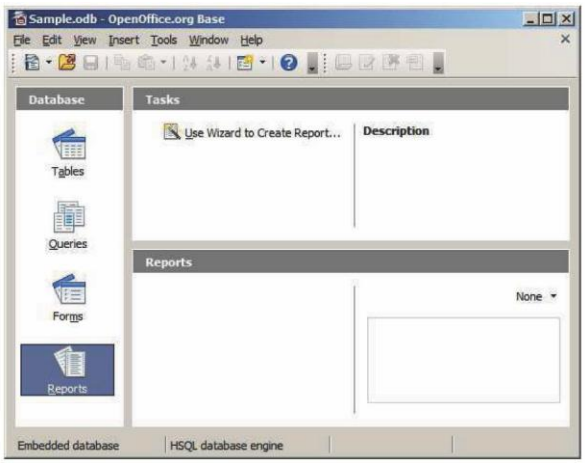


Figure 34

Now we can generate the report for the table created earlier.

Click on ***Use Wizard to Create Report…*** option available under Tasks.

Once you select the **Use Wizard to Create Report…** option. You should see a window similar to one displayed below.

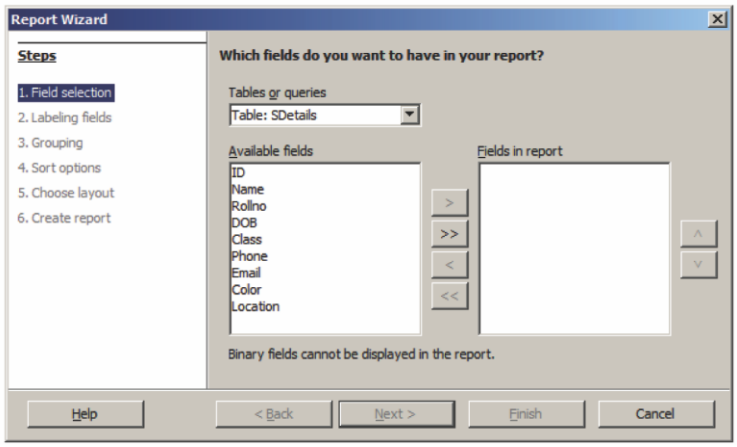


Figure 35

You have to select all the table fields by selecting the >> button, once you click the button >> you should see a dialog box similar to the one displayed below.

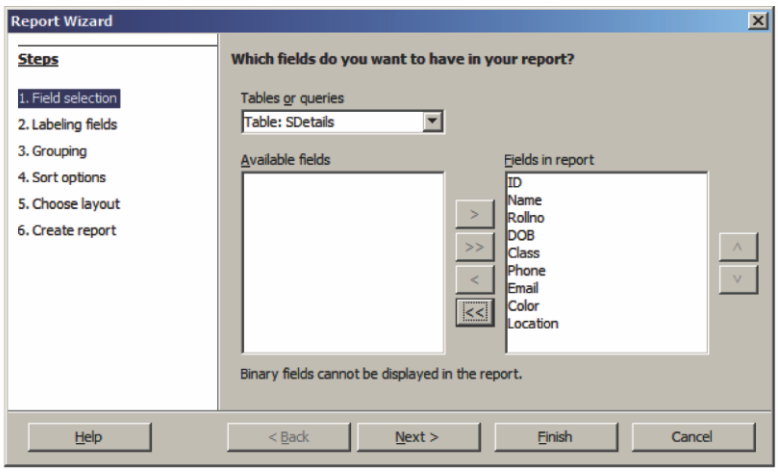


Figure 36

Click ***Next >.***

Once you click ***Next>.***you should see a dialog box similar to the one displayed below.

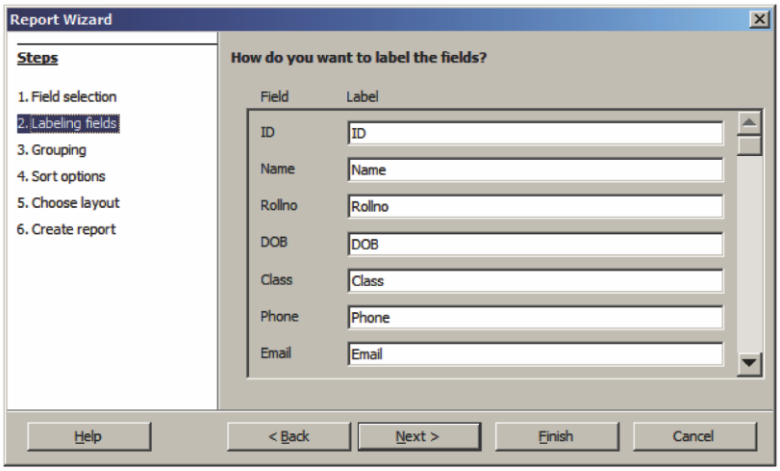


Figure 37

You can redefine the label of the fields in the reports or else you can set the default name.

Click ***Next >.***

Once you click ***Next >,*** you should see a dialog box similar to the one displayed below.

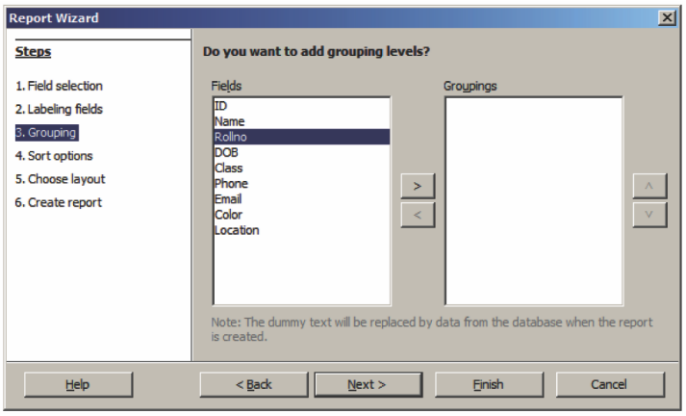


Figure 38

You can define grouping for the fields of the table.

Click ***Next >.***

Once you click ***Next >,*** you should see a dialog box similar to the one displayed below.

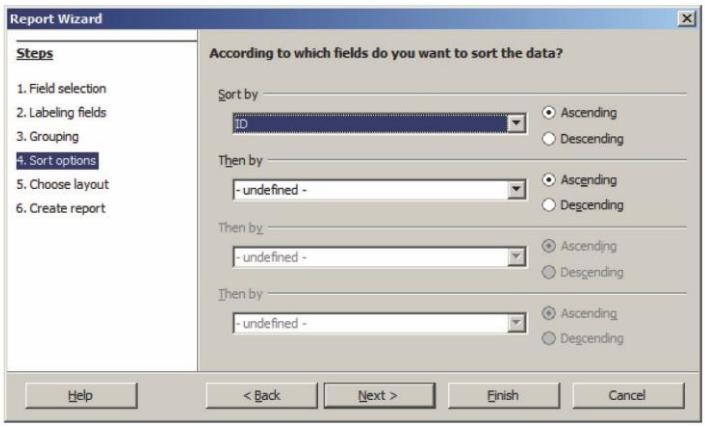


Figure 39

You can sort the field variables in the report by selecting the appropriate field and sorting method.

Click ***Next >.***

Once you click ***Next >,*** you should see a dialog box similar to the one displayed below.

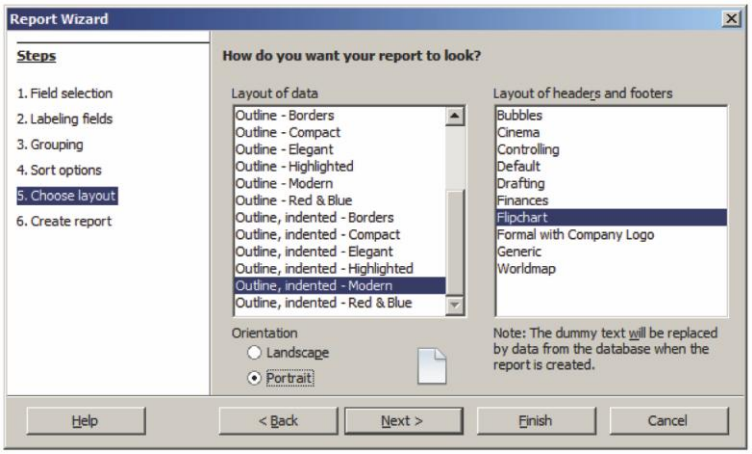


Figure 40

You can select the layout of the report by selecting the appropriate option available under the Layout of data down list and you can also select the orientation of the report.

Click ***Next >.***

Once you click ***Next >,*** you should see a dialog box similar to the one displayed below.

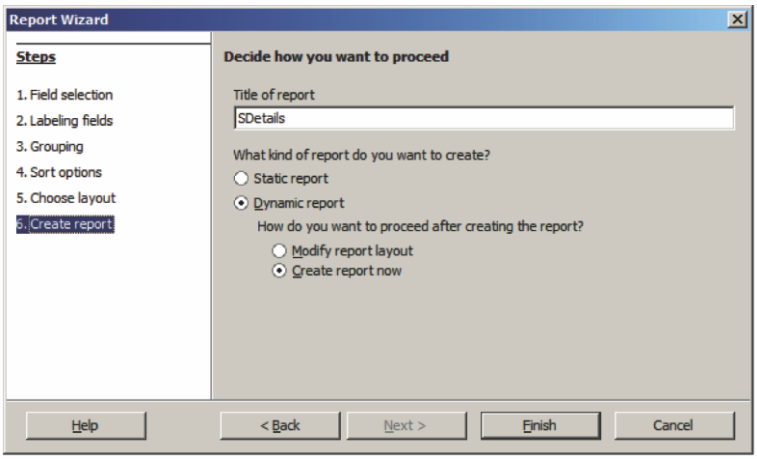
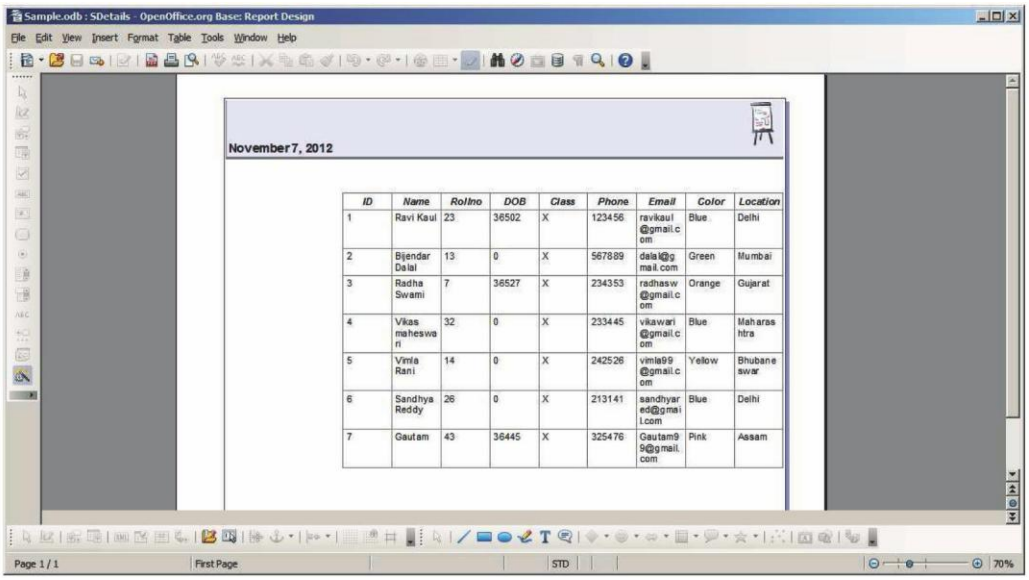


Figure 41

You can define a name for the report or you can use the name of the table itself for the report also.

Click ***Finish.***

Once you click ***Finish*** you should see a window similar to the one displayed below with the report.



ID	Name	RollNo	DOB	Class	Phone	Email	Color	Location
1	Ravi Kaul	23	36502	X	123456	ravikaul@gmail.com	Blue	Delhi
2	Bijendar Dalal	13	0	X	567889	dalal@gmail.com	Green	Mumbai
3	Radha Swami	7	36527	X	234353	radhasw@gmail.com	Orange	Gujarat
4	Vikas maheswari	32	0	X	233445	vikawari@gmail.com	Blue	Maharashtra
5	Vimla Rani	14	0	X	242526	vimla99@gmail.com	Yellow	Bhubaneswar
6	Sandhya Reddy	26	0	X	213141	sandhyared@gmail.com	Blue	Delhi
7	Gautam	43	36445	X	325476	Gautam99@gmail.com	Pink	Assam

Figure 42

Now create a report containing only Name, RollNo and Phone details. Use different layouts for the report design.

EXERCISE

Perform the following activities till you are confident:

S.No.	Activities
1.	Create a report to display data from table
2.	Open the academic database created earlier.
3.	Design a report to display your entire academic score card.

ASSESSMENT

Fill in the blanks:

1. A _____ is used to generate the overall work outcome in a clear format.
2. To create reports you need to select _____ option available under Tasks.