

Q #1) What is MySQL?

Answer:

MySQL is an open-source DBMS which is developed and distributed by Oracle Corporation.

It is supported by most of the popular operating systems, such as Windows, Linux, etc. It can be used to develop different types of applications but it is mainly used for developing web applications.

MySQL uses GPL (GNU General Public License) license so that anyone can download and install it for developing those applications which will be published or distributed freely. But if a user wants to develop any commercial application using MySQL then he/she will need to buy the commercial version of MySQL.

Q #2) What are the features of MySQL?

Answer:

MySQL has several useful features that make it a popular database management software.

Some important features of MySQL are mentioned below.

- It is reliable and easy to use too.
- It is a suitable database software for both large and small applications.
- Anyone can install and use it at no cost.
- It is supported by many well-known programming languages, such as PHP, Java, C++, PERL, etc.
- It supports standard SQL (Structured Query Language).
- The open-source license of MySQL is customizable. Hence, a developer can modify it according to the requirements of the application.

Q #3) What is the default port number of MySQL?

Answer:

MySQL Server's default port is **3306**. Apart from this, another standard default port for the SQL Server in TCP/IP is **1433**.

Q #4) How can you find out the version of the installed MySQL?

Answer:

The version of the installed MySQL server can be found out easily by running the following command from the MySQL prompt.

```
mysql> SHOW VARIABLES LIKE "%version%";
```

Q #5) What are the advantages and disadvantages of using MySQL?

Answer:

There are several advantages of MySQL which are making it a more popular database system now.

Some significant advantages and disadvantages of MySQL are mentioned below.

Advantages:

- It is well-known for its reliable and secure database management system. Transactional tasks of the website can be done more securely by using this software.
- It supports different types of storage engines to store the data and it works faster for this feature.
- It can handle millions of queries with a high-speed transactional process.
- It supports many advanced level database features, such as multi-level transactions, data integrity, deadlock identification, etc.
- Maintenance and debugging processes are easier for this software.

Disadvantages:

- It is hard to make MySQL scalable.
- It is not suitable for a very large type of database.
- The uses of stored routines and triggers are limited to MySQL.

Q #6) What is the function of myisamchk?

Answer:

myisamchk is a useful database utility tool that is used to get information about MyISAM database tables.

It is also used for checking, debugging, repairing and optimizing database tables. It is better to use this command when the server is down or when the required tables are not in use by the server.

Syntax:

myisamchk [OPTION] table_name...

The available options of this tool can be retrieved by using the following command.

myisamchk –help

To check or repair all MyISAM tables, the following command will be required for executing from the database directory location.

myisamchk *.MYI

Q #7) What are the purposes of using ENUM and SET data types?

Answer:

ENUM data type is used in the MySQL database table to select any one value from the predefined list.

The value of a particular field can be restricted by defining the predefined list as the field which is declared as ENUM will not accept any value outside the list.

The SET data type is used to select one or more or all values from the predefined list. This data type can also be used to restrict the field for inserting only the predefined list of values like ENUM.

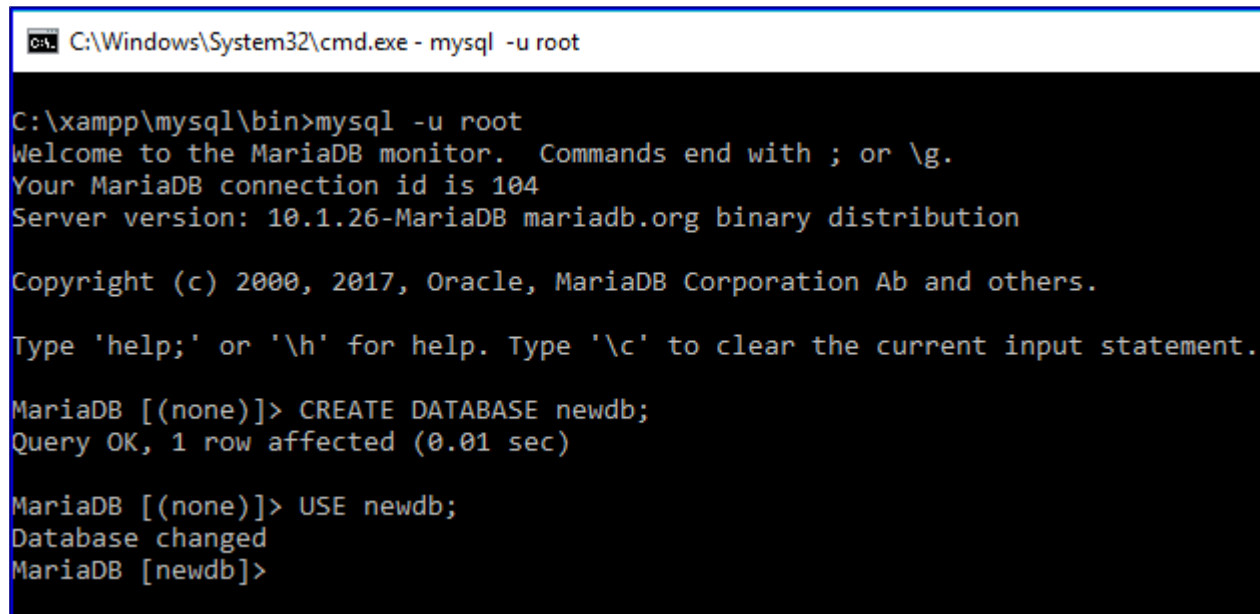
Example:

Run MySQL server from the command prompt and execute the following SQL commands to know the use of ENUM and SET data type.

The following SQL commands create a new database named '**newdb**' and select the database for use.

CREATE DATABASE newdb;

USE newdb;



```
C:\Windows\System32\cmd.exe - mysql -u root

C:\xampp\mysql\bin>mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 104
Server version: 10.1.26-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2017, Oracle, MariaDB Corporation Ab and others.

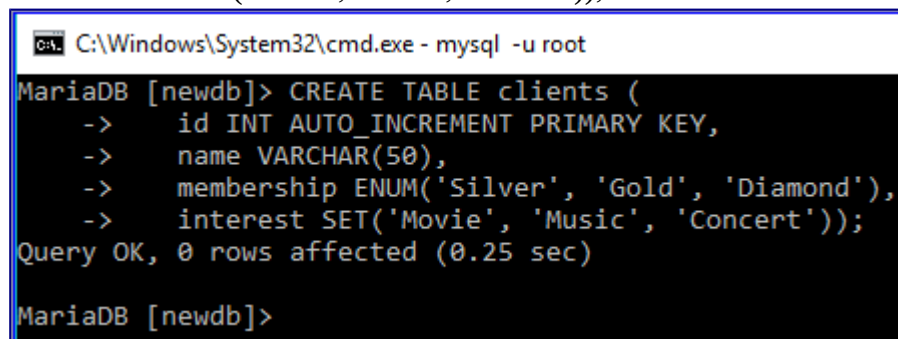
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE newdb;
Query OK, 1 row affected (0.01 sec)

MariaDB [(none)]> USE newdb;
Database changed
MariaDB [newdb]>
```

The following SQL command will create a table named **clients** with the fields ENUM and SET data type.

- 1 CREATE TABLE clients (
- 2 id INT AUTO_INCREMENT PRIMARY KEY,
- 3 name VARCHAR(50),
- 4 membership ENUM('Silver', 'Gold', 'Diamond'),
- 5 interest SET('Movie', 'Music', 'Concert'));



```
C:\Windows\System32\cmd.exe - mysql -u root

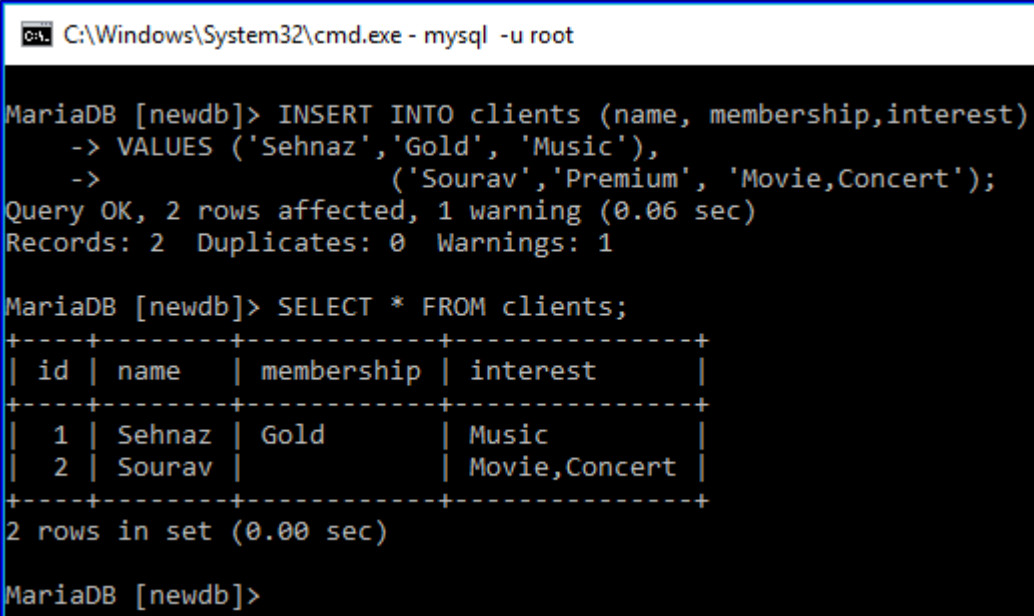
MariaDB [newdb]> CREATE TABLE clients (
-> id INT AUTO_INCREMENT PRIMARY KEY,
-> name VARCHAR(50),
-> membership ENUM('Silver', 'Gold', 'Diamond'),
-> interest SET('Movie', 'Music', 'Concert'));
Query OK, 0 rows affected (0.25 sec)

MariaDB [newdb]>
```

Insert queries will create two records in the table. ENUM field only accepts data from the defined list.

'Premium' value does not exist on the ENUM list. Hence, the value of the ENUM field will be empty for the second record. SET can accept multiple values and both the data will be inserted in the second record.

```
1 INSERT INTO clients (name, membership,interest)
2 VALUES ('Sehnaz','Gold', 'Music'),
3          ('Sourav','Premium', 'Movie,Concert');
4 SELECT * FROM clients;
```



```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> INSERT INTO clients (name, membership,interest)
-> VALUES ('Sehnaz','Gold', 'Music'),
->          ('Sourav','Premium', 'Movie,Concert');
Query OK, 2 rows affected, 1 warning (0.06 sec)
Records: 2  Duplicates: 0  Warnings: 1

MariaDB [newdb]> SELECT * FROM clients;
+----+-----+-----+-----+
| id | name  | membership | interest |
+----+-----+-----+-----+
| 1  | Sehnaz | Gold      | Music    |
| 2  | Sourav |            | Movie,Concert |
+----+-----+-----+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #8) What are the differences between a primary key and a foreign key?

Answer:

The database table uses a primary key to identify each row uniquely. It is necessary to declare the primary key on those tables that require to create a relationship among them. One or more fields of a table can be declared as the primary key.

When the primary key of any table is used in another table as the primary key or another field for making a database relation, then it is called a foreign key.

The differences between these two keys are mentioned below.

- The primary key uniquely identifies a record, whereas foreign key refers to the primary key of another table.
- The primary key can never accept a NULL value but foreign key accepts a NULL value.
- When a record is inserted in a table that contains the primary key then it is not necessary to insert the value on the table that contains this primary key field as the foreign key.
- When a record is deleted from the table that contains the primary key then the corresponding record must be deleted from the table containing the foreign key for data consistency. But any

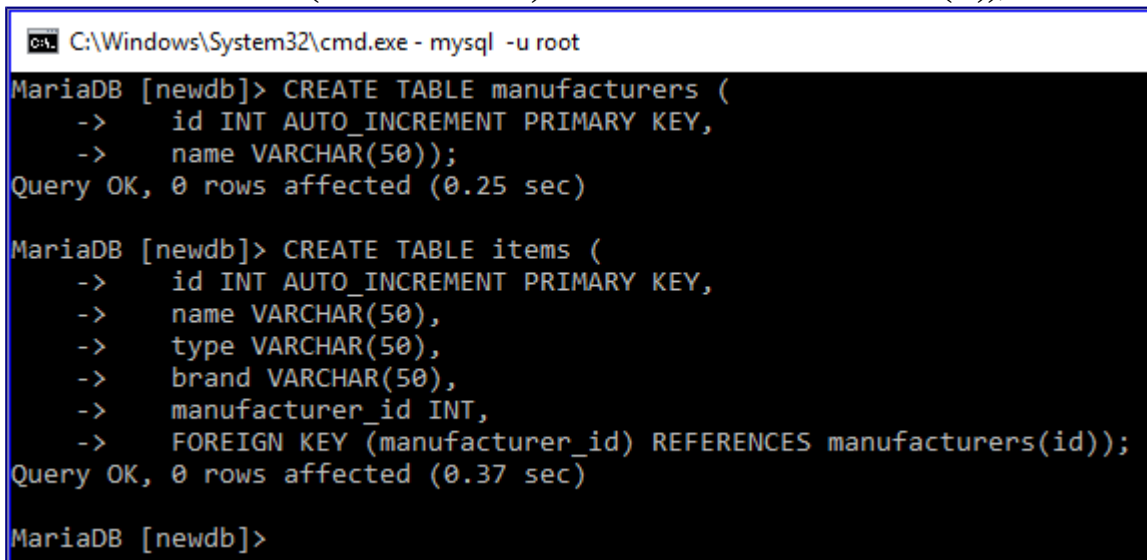
record can be deleted from the table that contains a foreign key without deleting a related record of another table.

Example:

Two tables named **manufacturers** and **items** will be created after executing the following two SQL commands.

Here, the primary key of the **manufacturer's** table is used as a foreign key in the **items** table with the field name **manufacturer_id**. Hence, the **manufacturer_id** field will contain only those values that exist in the **manufacturer's** table.

```
1 CREATE TABLE manufacturers (  
2   id INT AUTO_INCREMENT PRIMARY KEY,  
3   name VARCHAR(50));  
4 CREATE TABLE items (  
5   id INT AUTO_INCREMENT PRIMARY KEY,  
6   name VARCHAR(50),  
7   type VARCHAR(50),  
8   brand VARCHAR(50),  
9   manufacturer_id INT,  
10  FOREIGN KEY (manufacturer_id) REFERENCES manufacturers(id));
```



```
C:\Windows\System32\cmd.exe - mysql -u root  
MariaDB [newdb]> CREATE TABLE manufacturers (  
->   id INT AUTO_INCREMENT PRIMARY KEY,  
->   name VARCHAR(50));  
Query OK, 0 rows affected (0.25 sec)  
  
MariaDB [newdb]> CREATE TABLE items (  
->   id INT AUTO_INCREMENT PRIMARY KEY,  
->   name VARCHAR(50),  
->   type VARCHAR(50),  
->   brand VARCHAR(50),  
->   manufacturer_id INT,  
->   FOREIGN KEY (manufacturer_id) REFERENCES manufacturers(id));  
Query OK, 0 rows affected (0.37 sec)  
  
MariaDB [newdb]>
```

Q #9) What are the differences between CHAR and VARCHAR data types?

Answer:

Both CHAR and VARCHAR data types are used to store string data in the field of the table.

The differences between these data types are mentioned below:

- CHAR data type is used to store fixed-length string data and the VARCHAR data type is used to store variable-length string data.

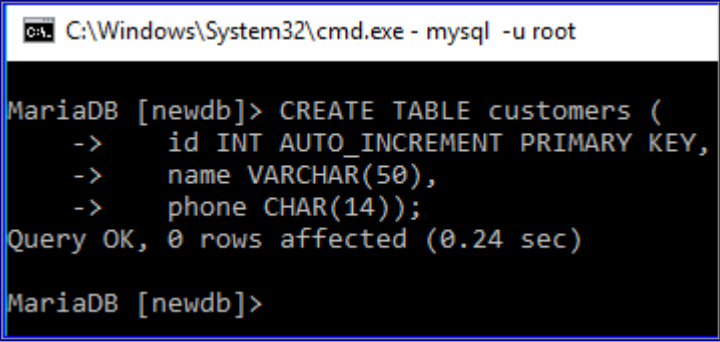
- The storage size of the CHAR data type will always be the maximum length of this data type and the storage size of VARCHAR will be the length of the inserted string data. Hence, it is better to use the CHAR data type when the length of the string will be the same length for all the records.
- CHAR is used to store small data whereas VARCHAR is used to store large data.
- CHAR works faster and VARCHAR works slower.

Example:

The following SQL statement will create a table named Customers. In this table, the data type of **name** field is VARCHAR and the data type of **phone** field is CHAR.

The size of the **name** field will depend on the length of the inserted value. The size of the **phone** field will always be 14 characters even if the length of the inserted value is less than 14 characters.

```
1 CREATE TABLE customers (
2   id INT AUTO_INCREMENT PRIMARY KEY,
3   name VARCHAR(50),
4   phone CHAR(14))
```



The screenshot shows a Windows command prompt window with the title bar "C:\Windows\System32\cmd.exe - mysql -u root". The prompt is "MariaDB [newdb]>". The user has entered the SQL command: "CREATE TABLE customers (id INT AUTO_INCREMENT PRIMARY KEY, name VARCHAR(50), phone CHAR(14));". The output shows "Query OK, 0 rows affected (0.24 sec)". The prompt is now "MariaDB [newdb]>".

Q #10) What is the purpose of using the TIMESTAMP data type?

Answer:

A TIMESTAMP data type is used to store the combination of date and time value which is 19 characters long.

The format of TIMESTAMP is YYYY-MM-DD HH:MM: SS. It can store data from '1970-01-01 00:00:01' UTC to '2038-01-19 03:14:07' UTC. By default, the current date and time of the server get inserted in the field of this data type when a new record is inserted or updated.

Q #11) What is the difference between mysql_fetch_array() and mysql_fetch_object() ?

Answer:

Both mysql_fetch_array() and mysql_fetch_object() are built-in methods of PHP to retrieve records from MySQL database table.

The difference between these methods is that mysql_fetch_array() returns the result set as an array and mysql_fetch_object() returns the result set as an object.

Example:

```
1 $result = mysql_query("SELECT id, name FROM clients");
2
3 //using mysql_fetch_array()
4 while ($row = mysql_fetch_array($result, MYSQL_NUM)) {
5     printf("ID: %s Name: %s", $row[0], $row[1]);
6 }
7
8 //using mysql_fetch_object()
9 while ($row = mysql_fetch_object($result)) {
10     printf("ID: %s Name: %s", $row->id, $row->name);
11 }
```

Q #12) How can you filter the duplicate data while retrieving records from the table?

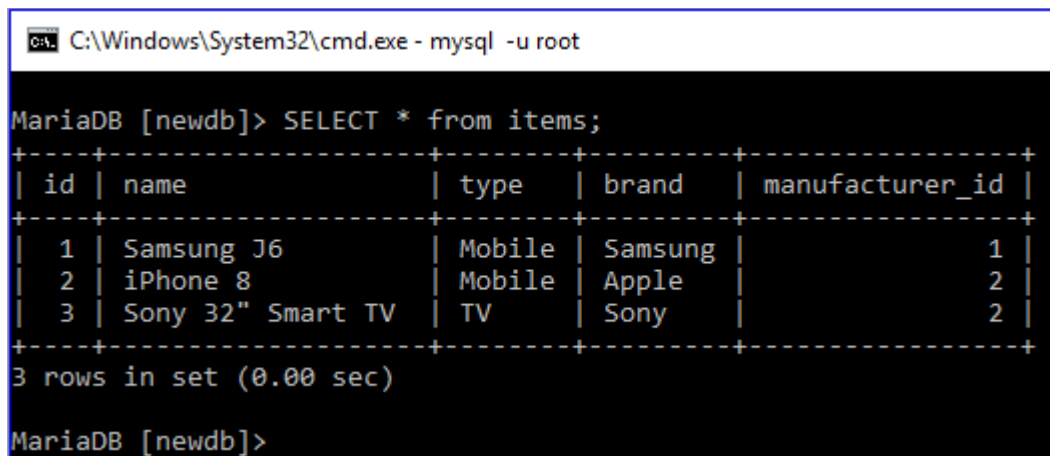
Answer:

A DISTINCT keyword is used to filter the duplicate data from the table while retrieving the records from a table.

Example:

The following SQL command shows all the records of the **items** table. The output shows that the table contains duplicate values in the Type field.

SELECT * from items;



```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT * from items;
+----+-----+-----+-----+-----+
| id | name          | type  | brand  | manufacturer_id |
+----+-----+-----+-----+-----+
| 1  | Samsung J6    | Mobile | Samsung | 1               |
| 2  | iPhone 8     | Mobile | Apple  | 2               |
| 3  | Sony 32" Smart TV | TV    | Sony   | 2               |
+----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

MariaDB [newdb]>
```

The following SQL command will display the values of the **type** field by removing duplicate values.

SELECT DISTINCT type from items;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT DISTINCT type from items;
+-----+
| type |
+-----+
| Mobile |
| TV |
+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #13) What is the difference between NOW() and CURRENT_DATE()?

Answer:

Both **NOW()** and **CURRENT_DATE()** are built-in MySQL methods. **NOW()** is used to show the current date and time of the server and **CURRENT_DATE()** is used to show only the date of the server.

SELECT now();

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT now();
+-----+
| now() |
+-----+
| 2018-12-30 19:24:39 |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

SELECT current_date();

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT current_date();
+-----+
| current_date() |
+-----+
| 2018-12-30 |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Q #14) Which statement is used in a select query for partial matching?

Answer:

REGEXP and **LIKE** statements can be used in a select query for partial matching. REGEXP is used to search records based on the pattern and LIKE is used to search any record by matching any string at the beginning or end or middle of a particular field value.

Example:

First, check the existing records of the '**clients**' table by executing the select query.

SELECT * FROM clients;

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [newdb]> SELECT * FROM clients;
+----+-----+-----+-----+
| id | name  | membership | interest |
+----+-----+-----+-----+
| 1  | Sehnaz | Gold       | Music    |
| 2  | Sourav |            | Movie, Concert |
| 3  | Amir  | Diamond   | Movie    |
+----+-----+-----+-----+
3 rows in set (0.00 sec)

MariaDB [newdb]>
```

Run SELECT query with REGEXP clause to search those records from the **clients** where the client name starts with 'S'

SELECT * FROM clients WHERE name REGEXP "^S";

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [newdb]> SELECT * FROM clients WHERE name REGEXP "^S";
+----+-----+-----+-----+
| id | name  | membership | interest |
+----+-----+-----+-----+
| 1  | Sehnaz | Gold       | Music    |
| 2  | Sourav |            | Movie, Concert |
+----+-----+-----+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]>
```

Run SELECT query with LIKE clause to search those records from the **clients** where the client name starts with 'A'

SELECT * FROM clients WHERE name LIKE "A%";

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT * FROM clients WHERE name LIKE "A%";
+-----+
| id | name | membership | interest |
+-----+
| 3 | Amir | Diamond    | Movie    |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Q #15) Which MySQL function is used to concatenate string?

Answer:

CONCAT() function is used to combine two or more string data. The use of this function is here with an example.

Example:

The following SELECT query with **CONCAT()** function will combine five words, 'Welcome ', 'to ', 'SoftwareTestingHelp', '.' and 'com'.

SELECT CONCAT('Welcome ', 'to ', 'SoftwareTestingHelp', '.', 'com');

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT CONCAT('Welcome ', 'to ', 'SoftwareTestingHelp', '.', 'com');
+-----+
| CONCAT('Welcome ', 'to ', 'SoftwareTestingHelp', '.', 'com') |
+-----+
| Welcome to SoftwareTestingHelp.com                          |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

CONCAT() function can be used on any table as well. The following SELECT query will show the output by combining two fields, **brand** and **type** of **items** table.

SELECT CONCAT(brand, '=>', type) from items;

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [newdb]> SELECT CONCAT(brand,'=>',type) from items;
+-----+
| CONCAT(brand,'=>',type) |
+-----+
| Samsung=>Mobile         |
| Apple=>Mobile            |
| Sony=>TV                 |
+-----+
3 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #16) How can you change the name of any existing table by using the SQL statement?

Answer:

The following SQL command is used to rename an existing table of the database.

RENAME TABLE table_name TO new_name

Example:

The following command will show the table list of the **newdb** database.

SHOW TABLES;

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [newdb]> SHOW TABLES;
+-----+
| Tables_in_newdb |
+-----+
| clients          |
| customers        |
| items            |
| manufacturers    |
+-----+
4 rows in set (0.00 sec)

MariaDB [newdb]>
```

The following rename command will rename the table **items** by new name **products**.

RENAME TABLE items TO products;

SHOW TABLES;

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [newdb]> RENAME TABLE items TO products;
Query OK, 0 rows affected (0.23 sec)

MariaDB [newdb]> SHOW TABLES;
+-----+
| Tables_in_newdb |
+-----+
| clients          |
| customers        |
| manufacturers    |
| products         |
+-----+
4 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #17) How can you retrieve a portion of any column value by using a select query?

Answer:

SUBSTR() function is used to retrieve the portion of any column. The use of this function is explained here with an example.

Example:

Here, the first select command is used to show all the records of the Products table and the second select command is executed using SUBSTR function and that prints only the first five characters of the name field.

SELECT * FROM products;

SELECT SUBSTR(name,1,5) FROM products;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT * FROM products;
+-----+-----+-----+-----+-----+
| id | name                | type  | brand  | manufacturer_id |
+-----+-----+-----+-----+-----+
| 1  | Samsung J6          | Mobile | Samsung | 1               |
| 2  | iPhone 8            | Mobile | Apple   | 2               |
| 3  | Sony 32" Smart TV   | TV     | Sony    | 2               |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

MariaDB [newdb]> SELECT SUBSTR(name,1,5) FROM products;
+-----+
| SUBSTR(name,1,5) |
+-----+
| Samsu            |
| iPhon            |
| Sony             |
+-----+
3 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #18) What is the purpose of using a HEAP table?

Answer:

The table which uses a hashed index and stores in the memory is called the HEAP table. It works as a temporary table and it uses the indexes that make it faster than another table type.

When MySQL crashes for any reason then all the data stored in this table can be lost. It uses fixed-length data types. Hence BLOB and TEXT data types are not supported by this table. It is a useful table for those MySQL tasks where speed is the most important factor and temporary data is used.

Q #19) How can you add and remove any column of a table?

Answer:

The syntax for adding any column in an existing table is shown below.

ALTER TABLE table_name ADD COLUMN column_name column_definition [FIRST|AFTER existing_column]

Example:

DESCRIBE command is used to show the structure of the products table.

DESCRIBE products;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> DESCRIBE products;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id             | int(11)       | NO   | PRI | NULL    | auto_increment |
| name           | varchar(50)   | YES  |     | NULL    |                |
| type           | varchar(50)   | YES  |     | NULL    |                |
| brand          | varchar(50)   | YES  |     | NULL    |                |
| manufacturer_id | int(11)       | YES  | MUL | NULL    |                |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.02 sec)

MariaDB [newdb]>
```

The following ALTER command with ADD COLUMN clause will add a new field named '**price**' in the table **products**.

ALTER TABLE products ADD COLUMN price DECIMAL(5,2);

DESCRIBE products;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> ALTER TABLE products ADD COLUMN price DECIMAL(5,2);
Query OK, 0 rows affected (0.48 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [newdb]> DESCRIBE products;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id             | int(11)       | NO   | PRI | NULL    | auto_increment |
| name           | varchar(50)   | YES  |     | NULL    |                |
| type           | varchar(50)   | YES  |     | NULL    |                |
| brand          | varchar(50)   | YES  |     | NULL    |                |
| manufacturer_id | int(11)       | YES  | MUL | NULL    |                |
| price          | decimal(5,2)  | YES  |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.04 sec)

MariaDB [newdb]>
```

The syntax for removing any column from an existing table is shown below.

ALTER TABLE table_name DROP COLUMN column_name;

Example:

The following ALTER command with a DROP COLUMN clause will remove the field named '**brand**' in the table '**products**'.

ALTER TABLE products DROP COLUMN brand;

DESCRIBE products;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> ALTER TABLE products DROP COLUMN brand;
Query OK, 0 rows affected (0.51 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [newdb]> DESCRIBE products;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id             | int(11)       | NO   | PRI | NULL    | auto_increment |
| name           | varchar(50)   | YES  |     | NULL    |                |
| type           | varchar(50)   | YES  |     | NULL    |                |
| manufacturer_id | int(11)       | YES  | MUL | NULL    |                |
| price          | decimal(5,2)  | YES  |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.04 sec)

MariaDB [newdb]>
```

Q #20) What is an index? How can an index be declared in MySQL?

Answer:

An index is a data structure of a MySQL table that is used to speed up the queries.

It is used by the database search engine to find out the records faster. One or more fields of a table can be used as an index key. Index key can be assigned at the time of table declaration or can be assigned after creating the table.

Example:

username and **email** fields are set as the index in the following create table statement.

```
1 CREATE TABLE users(
2     username VARCHAR(50) PRIMARY KEY,
3     email VARCHAR(50) NOT NULL,
4     password VARCHAR(50) NOT NULL,
5     INDEX (username, email));
```

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> CREATE TABLE users(
->     username VARCHAR(50) PRIMARY KEY,
->     email VARCHAR(50) NOT NULL,
->     password VARCHAR(50) NOT NULL,
->     INDEX (username, email));
Query OK, 0 rows affected (0.24 sec)

MariaDB [newdb]>
```

The following command will show the index key information of the ‘users’ table.

SHOW INDEXES FROM users;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SHOW INDEXES FROM users;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Table | Non_unique | Key_name | Seq_in_index | Column_name | Collation | Cardinality | Subpart |
|-----+-----+-----+-----+-----+-----+-----+-----+
| users | 0 | PRIMARY | 1 | username | A | 0 | 0 |
| users | 1 | username | 1 | username | A | 0 | 0 |
| users | 1 | username | 2 | email | A | 0 | 0 |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #21) What is meant by a decimal (5,2)?

Answer:

A decimal data type is used in MySQL to store the fractional data.

The meaning of decimal (5,2) means that the total length of the fractional value is 5. The field can contain 3 digits before the decimal point and 2 digits after the decimal point. If a user adds any value larger than the defined length then it will insert 999.99 in the field.

The use of this data type is explained in the following example.

Example:

In the following insert query, **789.56** is inserted in the **price** field. This value is less than 1000 and the total digits with the fractional part are 5. So, this value is valid for this field.

- 1 INSERT INTO products (type, name, price, manufacturer_id)
- 2 VALUES ('Mobile', 'iPhone 8', 789.56, 1);
- 3 SELECT * FROM products;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> INSERT INTO products (type, name, price, manufacturer_id)
-> VALUES ('Mobile', 'iPhone 8', 789.56, 1);
Query OK, 1 row affected (0.09 sec)

MariaDB [newdb]> SELECT * FROM products;
+----+-----+-----+-----+-----+
| id | name          | type  | manufacturer_id | price |
+----+-----+-----+-----+-----+
| 1  | Samsung J6    | Mobile | 1               | 777.45 |
| 2  | iPhone 8      | Mobile | 2               | 500.00 |
| 3  | Sony 32" Smart TV | TV    | 2               | 350.00 |
| 9  | iPhone 8      | Mobile | 1               | 789.56 |
+----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

In the following insert query, **34789.567** is set for the price field. Then this value is greater than 1000 and the total digits with fractional parts are 8. So, the default value 999.99 is inserted in the place of 34789.567.

- 1 INSERT INTO products (type, name, price, manufacturer_id)
- 2 VALUES('TV','Sony 32" Smart TV',34789.567, 2);
- 3 SELECT * FROM products;

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> INSERT INTO products (type, name, price, manufacturer_id)
-> VALUES ('TV', 'Sony 32" Smart TV', 34789.567, 2);
Query OK, 1 row affected, 1 warning (0.09 sec)

MariaDB [newdb]> SELECT * FROM products;
+----+-----+-----+-----+-----+
| id | name          | type  | manufacturer_id | price |
+----+-----+-----+-----+-----+
| 1  | Samsung J6    | Mobile | 1               | 777.45 |
| 2  | iPhone 8      | Mobile | 2               | 500.00 |
| 3  | Sony 32" Smart TV | TV    | 2               | 350.00 |
| 9  | iPhone 8      | Mobile | 1               | 789.56 |
| 10 | Sony 32" Smart TV | TV    | 2               | 999.99 |
+----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #22) What is view? How can you create and drop view in MySQL?

Answer:

A view works as a virtual table that is used to store query and returns a result set when it is called. An updatable view is also supported by MySQL.

How a view can be created or deleted in MySQL are shown in the following examples.

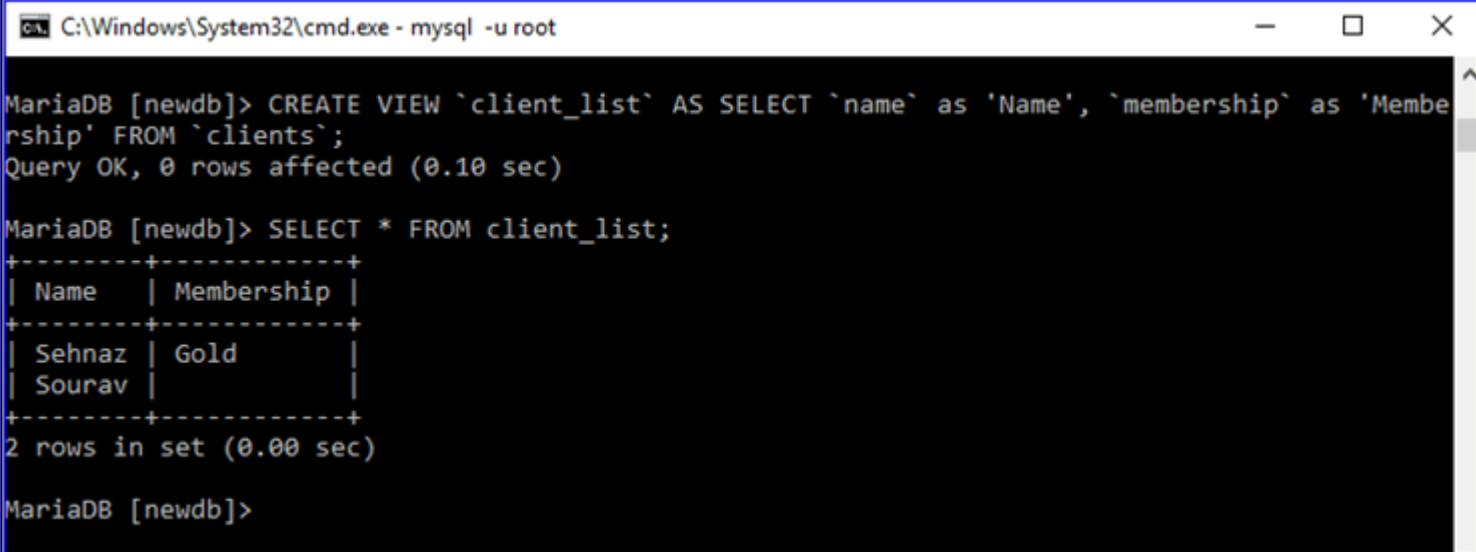
Create View Example:

The following statement will create a view file named '**client_list**' based on the table **clients**.

```
CREATE VIEW `client_list` AS SELECT `name` as 'Name', `membership` as 'Membership' FROM `clients`;
```

Select statement will display the records of **client_list** value.

```
SELECT * FROM client_list;
```



The screenshot shows a Windows command prompt window titled "C:\Windows\System32\cmd.exe - mysql -u root". Inside the prompt, the following commands and their outputs are shown:

```
MariaDB [newdb]> CREATE VIEW `client_list` AS SELECT `name` as 'Name', `membership` as 'Membership' FROM `clients`;
Query OK, 0 rows affected (0.10 sec)

MariaDB [newdb]> SELECT * FROM client_list;
+-----+-----+
| Name  | Membership |
+-----+-----+
| Sehnaz | Gold       |
| Sourav |            |
+-----+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]>
```

Drop View Example:

The drop view statement will delete the view file. The select query will show an error after deleting the view.

```
DROP VIEW client_list;
```

```
SELECT * FROM client_list;
```

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> DROP VIEW client_list;
Query OK, 0 rows affected (0.01 sec)

MariaDB [newdb]> SELECT * FROM client_list;
ERROR 1146 (42S02): Table 'newdb.client_list' doesn't exist
MariaDB [newdb]>
```

Q #23) What is the function of mysqldump?

Answer:

mysqldump is a useful utility tool of MySQL that is used to dump one or more or all databases from the server for backup or transfer to another database server.

Syntax:

For a single database,

mysqldump [OPTIONS] db_name [TABLES]

For multiple databases,

mysqldump [OPTIONS] --databases DB1 [DB2 DB3...]

For all databases,

mysqldump [OPTIONS] --all-databases

Example:

The following command will create a dump of the 'newdb' database and export the content of the database in the file, **newdb.sql**.

mysqldump --databases newdb > newdb.sql

```
C:\Windows\System32\cmd.exe

C:\xampp\mysql\bin>mysqldump -u root --databases newdb > newdb.sql
C:\xampp\mysql\bin>
```

Q #24) How can you change the password of a MySQL user?

Answer:

SET **PASSWORD** statement is used to change the password of a MySQL user.

Syntax:

SET PASSWORD FOR 'username'@'hostname' = PASSWORD('password');

Example:

The following statement will set or change the root password.

SET PASSWORD FOR 'root'@'localhost' = PASSWORD('123456');

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [newdb]> SET PASSWORD FOR 'root'@'localhost' = PASSWORD('123456');
Query OK, 0 rows affected (0.00 sec)

MariaDB [newdb]>
```

Q #25) What is the difference between UNIX TIMESTAMP and MySQL TIMESTAMP?**Answer:**

Both UNIX TIMESTAMP and MySQL TIMESTAMP are used to represent the date and time value. The main difference between these values is that UNIX TIMESTAMP represents the value by using 32-bits integers and MySQL TIMESTAMP represents the value in the human-readable format.

Example:

A UNIX time value is used by FROM_UNIXTIME function in the SELECT query to get the date and time value in the human-readable format.

SELECT FROM_UNIXTIME (1596222320) AS 'MySQLTIMESTAMP';

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [newdb]> SELECT FROM_UNIXTIME(1596222320) AS 'MySQLTIMESTAMP';
+-----+
| MySQLTIMESTAMP |
+-----+
| 2020-08-01 01:05:20 |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Date and time value is used by UNIX_TIMESTAMP function in the SELECT query to get the date and time value in the UNIX format.

SELECT UNIX_TIMESTAMP ('2018-12-25 09:45:40') AS 'UNIXTIMESTAMP';

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [newdb]> SELECT UNIX_TIMESTAMP('2018-12-25 09:45:40') AS 'UNIXTIMESTAMP';
+-----+
| UNIXTIMESTAMP |
+-----+
|      1545709540 |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Q #26) How can you import tables from a SQL file into a database by using the MySQL client?

Answer:

Database tables can be imported into a database from a SQL file by using the following MySQL statement.

mysql -u username -p database_name < sql_filename

Example:

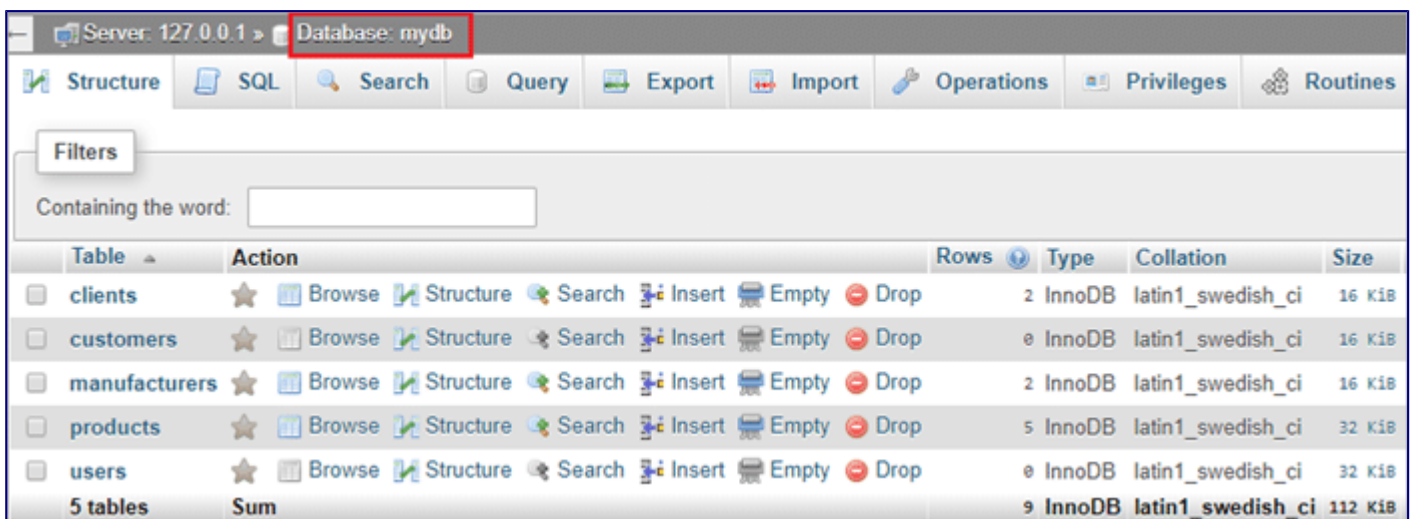
If the root user's password is empty, then the following command will import tables from 'newdb.sql' file into the database 'mydb'.

mysql -u root mydb < newdb.sql

```
C:\Windows\System32\cmd.exe

C:\xampp\mysql\bin>mysql -u root mydb < newdb.sql

C:\xampp\mysql\bin>
```



The screenshot shows the phpMyAdmin interface for a database named 'mydb' on server 127.0.0.1. The 'Database: mydb' tab is selected. The interface includes a menu bar with options like Structure, SQL, Search, Query, Export, Import, Operations, Privileges, and Routines. Below the menu is a 'Filters' section with a search box. The main area displays a table of database tables with columns for Table, Action, Rows, Type, Collation, and Size.

Table	Action	Rows	Type	Collation	Size
clients	★ Browse Structure Search Insert Empty Drop	2	InnoDB	latin1_swedish_ci	16 KiB
customers	★ Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 KiB
manufacturers	★ Browse Structure Search Insert Empty Drop	2	InnoDB	latin1_swedish_ci	16 KiB
products	★ Browse Structure Search Insert Empty Drop	5	InnoDB	latin1_swedish_ci	32 KiB
users	★ Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	32 KiB
5 tables	Sum	9	InnoDB	latin1_swedish_ci	112 KiB

Q #27) What is the difference between the Primary key and the Unique key?

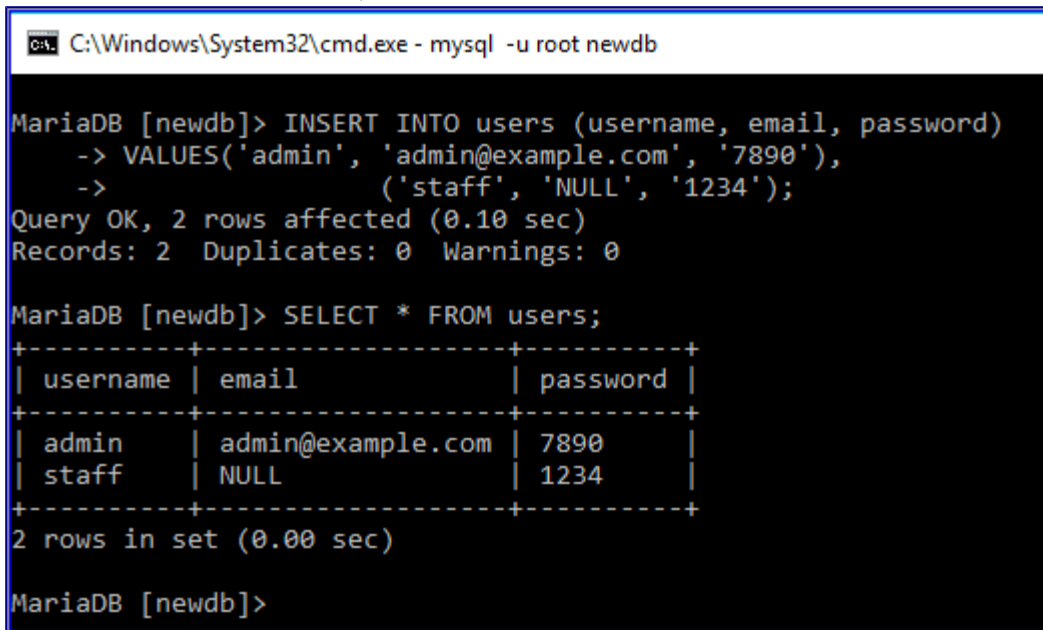
Answer:

Unique data is stored in the primary key and unique key fields. The primary key field never accepts NULL value but a unique key field accepts a NULL value.

Example:

In the **users** table, the **id** field is the **primary key** and the **email** field is a **unique key**. Two records are inserted in the table where the email field is NULL for the 2nd record. The records are inserted properly as the unique field supports a NULL value.

- 1 INSERT INTO users (username, email, password)
- 2 VALUES('admin', 'admin@example.com', '7890'),
- 3 ('staff', 'NULL', '1234');
- 4 SELECT * FROM users;



```
C:\Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> INSERT INTO users (username, email, password)
-> VALUES('admin', 'admin@example.com', '7890'),
-> ('staff', 'NULL', '1234');
Query OK, 2 rows affected (0.10 sec)
Records: 2  Duplicates: 0  Warnings: 0

MariaDB [newdb]> SELECT * FROM users;
+-----+-----+-----+
| username | email          | password |
+-----+-----+-----+
| admin    | admin@example.com | 7890     |
| staff    | NULL           | 1234     |
+-----+-----+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #28) What is the purpose of using the IFNULL() function?

Answer:

IFNULL() function takes two arguments. It returns the first argument value if the value of the first argument is not NULL and it returns the second argument if the value of the first argument is NULL.

Example:

Here, the first argument of the IFNULL function is not NULL. So, the output is the first argument value.

```
SELECT IFNULL ("Tutorial", "fahmidasclassroom.com");
```

```
C:\Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> SELECT IFNULL ("Tutorial", "fahmidasclassroom.com");
+-----+
| IFNULL ("Tutorial", "fahmidasclassroom.com") |
+-----+
| Tutorial                                     |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Here, the first argument of the IFNULL function is NULL. So, the output is NULL.

SELECT IFNULL ("NULL", "fahmidasclassroom.com");

```
C:\Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> SELECT IFNULL ("NULL", "fahmidasclassroom.com");
+-----+
| IFNULL ("NULL", "fahmidasclassroom.com") |
+-----+
| NULL                                     |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Q #29) What is a join? Explain the different types of MySQL joins.

Answer:

The SQL statement that is used to make a connection between two or more tables based on the matching columns is called a join. It is mainly used for complex queries.

Different types of SQL joins are mentioned below:

- **Inner Join:** It is a default join. It returns records when the values match in the joining tables.
- **Left Outer Join:** It returns all the records from the left table based on the matched records from the right table.
- **Right Outer Join:** It returns all the records from the right table based on the matched records from the left table.
- **Full Outer Join:** It returns all the records that match from the left or right table.

Example:

Two tables, **manufacturers** and **products** are used in this example to show the use of INNER JOIN. Here, SELECT queries are used to show the current records of these two tables.

SELECT * FROM manufacturers;

SELECT * FROM products;

```
C:\Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> SELECT * FROM manufacturers;
+----+-----+
| id | name           |
+----+-----+
| 1  | ABC Company    |
| 2  | Ryan Electronics |
+----+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]> SELECT * FROM products;
+----+-----+-----+-----+-----+
| id | name                | type   | manufacturer_id | price |
+----+-----+-----+-----+-----+
| 1  | Samsung J6          | Mobile | 1               | 777.45 |
| 2  | iPhone 8            | Mobile | 2               | 500.00 |
| 3  | Sony 32" Smart TV   | TV     | 2               | 350.00 |
| 9  | iPhone 8            | Mobile | 1               | 789.56 |
| 10 | Sony 32" Smart TV   | TV     | 2               | 999.99 |
+----+-----+-----+-----+-----+
5 rows in set (0.05 sec)

MariaDB [newdb]>
```

INNER JOIN is used in the following SELECT query where all the id and name of the products table will be displayed based on matching **manufacturer_id** of the **products** with an **id** of the **manufacturer's** table.

- 1 SELECT products.id, products.name
- 2 FROM products
- 3 INNER JOIN manufacturers ON manufacturers.id= products.manufacturer_id;


```
C:\Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> SELECT products.id, products.name
-> FROM products
-> INNER JOIN manufacturers ON manufacturers.id= products.manufacturer_id;
+----+-----+
| id | name                |
+----+-----+
| 1  | Samsung J6          |
| 2  | iPhone 8            |
| 3  | Sony 32" Smart TV  |
| 9  | iPhone 8            |
| 10 | Sony 32" Smart TV  |
+----+-----+
5 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #30) How can you retrieve a particular number of records from a table?

Answer:

LIMIT clause is used with the SQL statement to retrieve a particular number of records from a table. From which record and how many records will be retrieved are defined by the LIMIT clause.

Syntax:

LIMIT starting_number, number_of_rows

Example:

Products table has 5 records which are displayed by the first select query and the second select query is used to display the records from 2nd to 3rd by using LIMIT 1, 2.

SELECT * FROM products;

SELECT * FROM products LIMIT 1, 2;

```
C:\Windows\System32\cmd.exe - mysql -u root newdb
MariaDB [newdb]> SELECT * FROM products;
+----+-----+-----+-----+-----+
| id | name          | type  | manufacturer_id | price |
+----+-----+-----+-----+-----+
| 1  | Samsung J6    | Mobile | 1               | 777.45 |
| 2  | iPhone 8      | Mobile | 2               | 500.00 |
| 3  | Sony 32" Smart TV | TV    | 2               | 350.00 |
| 9  | iPhone 8      | Mobile | 1               | 789.56 |
| 10 | Sony 32" Smart TV | TV    | 2               | 999.99 |
+----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

MariaDB [newdb]> SELECT * FROM products LIMIT 1, 2;
+----+-----+-----+-----+-----+
| id | name          | type  | manufacturer_id | price |
+----+-----+-----+-----+-----+
| 2  | iPhone 8      | Mobile | 2               | 500.00 |
| 3  | Sony 32" Smart TV | TV    | 2               | 350.00 |
+----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]>
```

Q #31) How can you export the table as an XML file in MySQL?

Answer:

‘-X’ option is used with ‘mysql’ command for exporting the file as XML. The following statement will export any table from a database as an XML file.

mysql -u username -X -e “SELECT query” database_name

Example:

The following command will export the data of the **items** table into an **xmlData.xml** file.

mysql -u root -X -e “SELECT * from products” newdb > xmlData.xml

```
C:\Windows\System32\cmd.exe

C:\xampp\mysql\bin>mysql -u root -X -e "SELECT * from products" newdb > xmlData.xml
C:\xampp\mysql\bin>
```

Q #32) What is a CSV table?

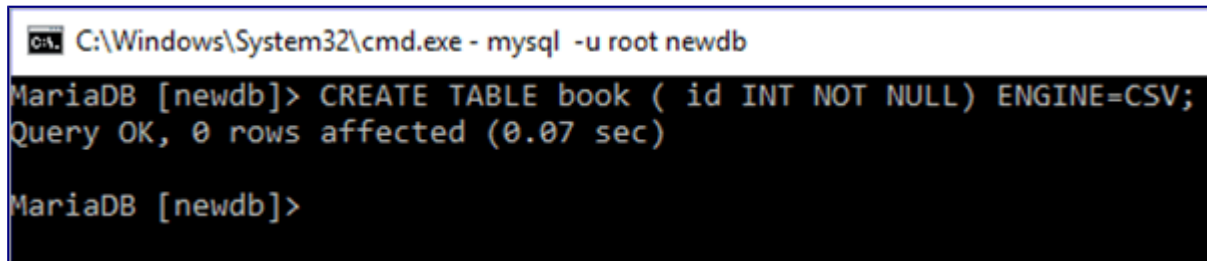
Answer:

MySQL table that uses the CSV storage engine is called a CSV table. Data are stored as comma-separated values in the CSV table. MySQL server creates a data file with an extension '.csv' to store the content of the CSV table.

Example:

The following create statement will create a CSV file named book.

CREATE TABLE book (id INT NOT NULL) ENGINE=CSV;

A screenshot of a Windows command prompt window. The title bar reads 'C:\Windows\System32\cmd.exe - mysql -u root newdb'. The prompt is 'MariaDB [newdb]>'. The user has entered the command 'CREATE TABLE book (id INT NOT NULL) ENGINE=CSV;'. The output is 'Query OK, 0 rows affected (0.07 sec)'. The prompt is now 'MariaDB [newdb]>'.

Q #33) How can you calculate the sum of any column of a table?

Answer:

SUM() function is used to calculate the sum of any column.

Syntax:

SUM(DISTINCT expression)

Example:

Products table has a numeric field named, price. In this example, the **SUM() function** is used to calculate the total value of the **price** field.

- 1 SELECT * FROM products;
- 2 SELECT SUM(price) as total FROM products;

```
Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> SELECT * FROM products;
+----+-----+-----+-----+
| id | name          | type  | manufacturer_id | price |
+----+-----+-----+-----+
| 1  | Samsung J6    | Mobile | 1               | 777.45 |
| 2  | iPhone 8      | Mobile | 2               | 500.00 |
| 3  | Sony 32" Smart TV | TV    | 2               | 350.00 |
| 9  | iPhone 8      | Mobile | 1               | 789.56 |
| 10 | Sony 32" Smart TV | TV    | 2               | 999.99 |
+----+-----+-----+-----+
5 rows in set (0.07 sec)

MariaDB [newdb]> SELECT SUM(price) as total FROM products;
+-----+
| total |
+-----+
| 3417.00 |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Q #34) How can you count the total number of records of any table?

Answer:

COUNT() function is used to count the total number of records of any table.

Syntax:

COUNT(expression)

Example:

The following select query is used to count the total number of records of the **products** table.

SELECT COUNT(*) as `Total Records` FROM products;

```
C:\Windows\System32\cmd.exe - mysql -u root newdb
MariaDB [newdb]> SELECT COUNT(*) as `Total Records` FROM products;
+-----+
| Total Records |
+-----+
|          5 |
+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Q #35) Explain the difference between delete and truncate.

Answer:

Both DELETE and TRUNCATE commands are used to delete the records from any database table. However, there are some significant differences between these commands. If the table contains the AUTO_INCREMENT PRIMARY KEY field then the effect of these commands can be shown properly.

Two differences between these commands are mentioned below.

#1) DELETE command is used to delete a single or multiple or all the records from the table. The TRUNCATE command is used to delete all the records from the table or make the table empty.

#2) When DELETE command is used to delete all the records from the table then it doesn't re-initialize the table. So, the AUTO_INCREMENT field does not count from one when the user inserts any record.

But when all the records of any table are deleted by using TRUNCATE command then it re-initializes the table and a new record will start from one for the AUTO_INCREMENT field.

Example:

The previously created user table is used in this example.

First, the SELECT query will show all the records of the users table. DELETE query will delete all the records from the user's table. INSERT query will insert a new record into the users table. After insert, if the SELECT query executes again then it will be shown that a new **id** is calculated after the deleted **id**.

- 1 SELECT * FROM users;
- 2 DELETE FROM users;
- 3 INSERT INTO users (username, email)
- 4 VALUES ('Durjoy', 'durjoy@gmail.com');
- 5 SELECT * FROM users;

Currently, there are two records in the users table and when a new record is inserted after deleting all the records then the new id is 3, and not 1.

```
C:\Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> SELECT * FROM users;
+-----+-----+-----+-----+
| id | username | email          | password |
+-----+-----+-----+-----+
| 1 | admin    | admin@gmail.com | 7890     |
| 2 | staff    | NULL           | 1234     |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)

MariaDB [newdb]> DELETE FROM users;
Query OK, 2 rows affected (0.10 sec)

MariaDB [newdb]> INSERT INTO users (username, email)
->      VALUES ('Durjoy', 'durjoy@gmail.com');
Query OK, 1 row affected, 1 warning (0.07 sec)

MariaDB [newdb]> SELECT * FROM users;
+-----+-----+-----+-----+
| id | username | email          | password |
+-----+-----+-----+-----+
| 3 | Durjoy   | durjoy@gmail.com |          |
+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

The same queries are executed in this part, just used the TRUNCATE statement in place of DELETE. It is shown that the id value of the new record is 1.

- 1 TRUNCATE table users;
- 2 INSERT INTO users (username, email)
- 3 VALUES ('Farheen', 'farheen@gmail.com');
- 4 SELECT * FROM users;

```
C:\Windows\System32\cmd.exe - mysql -u root newdb
MariaDB [newdb]> TRUNCATE table users;
Query OK, 0 rows affected (0.27 sec)

MariaDB [newdb]> INSERT INTO users (username,email)
->      VALUES ('Farheen', 'farheen@gmail.com');
Query OK, 1 row affected, 1 warning (0.08 sec)

MariaDB [newdb]> SELECT * FROM users;
+----+-----+-----+-----+
| id | username | email          | password |
+----+-----+-----+-----+
| 1  | Farheen  | farheen@gmail.com |          |
+----+-----+-----+-----+
1 row in set (0.00 sec)

MariaDB [newdb]>
```

Q #36) What is a storage engine? What are the differences between InnoDB and MyISAM engines?

Answer:

One of the major components of the MySQL server is the storage engine for doing different types of database operations. Each database table created is based on the specific storage engine.

MySQL supports two types of storage engines i.e **transactional and non-transactional**. InnoDB is the default storage engine of MySQL which is transactional. MyISAM storage engine is a non-transactional storage engine.

The differences between InnoDB and MyISAM storage engines are discussed below:

- MyISAM supports the FULLTEXT index but InnoDB doesn't support the FULLTEXT index.
- MyISAM is faster and InnoDB is slower.
- InnoDB supports ACID (Atomicity, Consistency, Isolation, and Durability) property but MyISAM doesn't.
- InnoDB supports row-level locking and MyISAM supports table-level locking.
- InnoDB is suitable for large database and MyISAM is suitable for a small database.

Q #37) What is a transaction? Describe MySQL transaction properties.

Answer:

When a group of database operations is done as a single unit then it is called a transaction. If any task of the transactional tasks remains incomplete then the transaction will not succeed. Hence, it is mandatory to complete all the tasks of a transaction to make the transaction successful.

A transaction has four properties which are known as ACID property. These properties are described below.

- **Atomicity:** It ensures that all the tasks of a transaction will be completed successfully otherwise all the completed tasks will be rolled back to the previous state for any failure.
- **Consistency:** It ensures that the database state must be changed accurately for the committed transaction.
- **Isolation:** It ensures that all the tasks of a transaction will be done independently and transparently.
- **Durability:** It ensures that all the committed transaction is consistent for any type of system failure.

Q #38) What are the functions of commit and rollback statements?

Answer:

Commit is a transaction command that executes when all the tasks of a transaction are completed successfully. It will modify the database permanently to confirm the transaction.

Syntax:

COMMIT;

Rollback is another transactional command that executes when any of the transactional tasks become unsuccessful and undoes all the changes that are made by any transactional task to make the transaction unsuccessful.

Syntax:

ROLLBACK;

Q #39) What is the difference between MyISAM Static and MyISAM Dynamic?

Answer:

MyISAM Static and MyISAM dynamic are the variations of the MyISAM storage engine. The differences between these tables are mentioned below.

- All the fields of MyISAM static table are of a fixed length and MyISAM dynamic table accepts variable length fields such as BLOB, TEXT, etc.
- After data corruption, it is easier to restore the MyISAM static table than MyISAM dynamic table.

Q #40) What is a trigger? How you can create a trigger in MySQL?

Answer:

One of the important features of the MySQL database is a trigger that executes automatically when a particular database event occurs.

It fires after or before the execution of an insert or update or deletes a statement. It is a very useful option when a database user wants to do some database operations automatically.

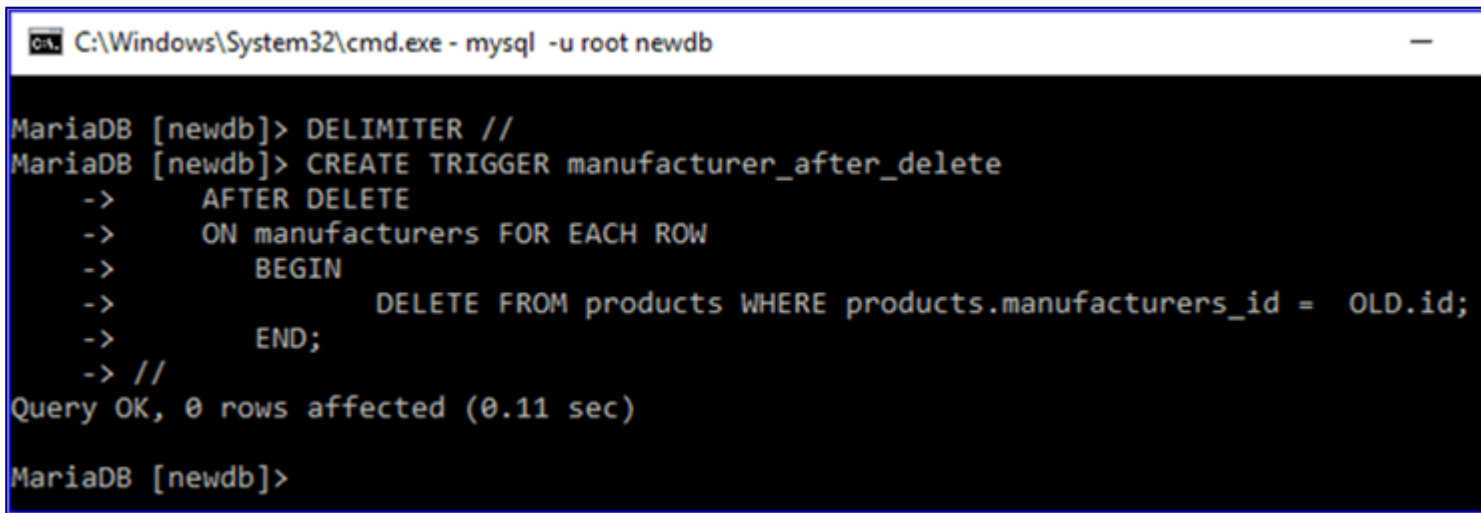
Trigger Example:

If you want to delete the items of a supplier from the **items** table automatically after deleting the entry of the particular supplier from the '**suppliers**' table then write the trigger in the following way.

Example:

This is an example of after delete trigger that will fire automatically when any record is removed from the **manufacturer** table and deletes all the records from the **products** table where the deleted **id** of the **manufacturer** table matches with the **manufacturer_id** field of the **products** table.

```
1 DELIMITER //
2 CREATE TRIGGER manufacturer_after_delete
3 AFTER DELETE
4 ON manufacturers FOR EACH ROW
5 BEGIN
6 DELETE FROM products WHERE products.manufacturers_id = OLD.id;
7 END;
8 //
```



```
C:\Windows\System32\cmd.exe - mysql -u root newdb

MariaDB [newdb]> DELIMITER //
MariaDB [newdb]> CREATE TRIGGER manufacturer_after_delete
  -> AFTER DELETE
  -> ON manufacturers FOR EACH ROW
  -> BEGIN
  -> DELETE FROM products WHERE products.manufacturers_id = OLD.id;
  -> END;
  -> //
Query OK, 0 rows affected (0.11 sec)

MariaDB [newdb]>
```

Q> Can you tell what are the different set operations available in MySQL?

The various set operations available in MySQL are as follows:

- **UNION** – This operation returns all the distinct rows selected by a query
- **UNION ALL** – This operation returns all the rows selected by a query and also includes all duplicate rows.

- **MINUS** – This operation returns all the distinct rows selected by the first query but does not select the rows selected by the second query.
- **INTERSECT** – This operation returns all the distinct rows selected by both queries.

Refer to the below image:

Q> Can you tell the order of SQL SELECT statement?

The order of SQL SELECT statement is as follows:

1 SELECT, FROM, WHERE, GROUP BY, HAVING, ORDER BY.

Q> What is a Cursor?

Considered as a pointer to point to one row in a set of rows, a Cursor is nothing but a control which enables traversal over the records in the table. So, the cursor is used for performing traversing actions such as addition, retrieval, and removal of records in a database.

Q> How can you test for NULL values in a database?

A NULL value is a field with no value present in that particular field. Since the NULL value cannot be compared to any other NULL values, you cannot use the comparison operators such as =, <, or <>. To compare the fields with NULL values, you have to use the IS NULL and IS NOT NULL operator.

Refer below for Syntax of IS NULL and IS NOT NULL.

```
1 SELECT column_names FROM table_name WHERE column_name IS NULL;
2 SELECT column_names FROM table_name WHERE column_name IS NOT NULL;
```

Q> Can you elaborate on BLOB and TEXT in MySQL?

BLOB

[BLOB](#) (Binary Large Object) is used to hold a variable amount of data and holds up to 65,535 bytes of data. The following are the four types of BLOB.

- TINYBLOB
- BLOB
- MEDIUMBLOB
- LONGBLOB

TEXT

TEXT is used to store string values and holds up to a maximum length of 65,535 characters. The following are the four types of TEXT

- TINYTEXT
- TEXT
- MEDIUMTEXT

- LONGTEXT

Q> How To Display Nth Highest Salary From A Table In A Mysql Query?

Consider the table named “Employee”.

Now, to find the Nth salary consider the below statement.

```
SELECT DISTINCT(salary) FROM employee ORDER BY salary DESC LIMIT n-1,1
```

So, if you want to find out the 7th largest salary, consider the below query.

```
1SELECT DISTINCT(salary) FROM employee ORDER BY salary DESC LIMIT 6,1
```

Q> Identify what is wrong in the below query.

```
SELECT EmployeeID, AVG(Salary)
```

```
FROM EmployeeDetails
```

```
WHERE AVG(Salary) > 75
```

```
GROUP BY EmployeeID
```

The answer is quite simple. You cannot use the WHERE clause to restrict the groups. Instead of this, you have to use the HAVING clause.

Your query should be as follows:

```
1SELECT EmployeeID, AVG(Salary)
```

```
2FROM EmployeeDetails
```

```
3HAVING AVG(Salary) > 75
```

```
4GROUP BY EmployeeID
```

Q> Can you tell which of the following WHERE clauses is faster?

```
WHERE col *4 < 16
```

```
WHERE col < 16/4
```

If we compare both the statements, then the second WHERE clause would be comparatively faster than the first one. That is because, for the first statement, MYSQL would retrieve the value of ‘col’ for each and every row, multiplied by four. After that, it would compare the result to 16. Also, in the first case no Index can be used, and hence it makes it further slow.

Q> What is the main difference between ‘BETWEEN’ and ‘IN’ condition operators?

BETWEEN operator is used to display rows based on a range of values in a row whereas the IN condition operator is used to check for values contained in a specific set of values.

Example of BETWEEN:

```
1 SELECT * FROM Students where ROLL_NO BETWEEN 10 AND 50;
```

Example of IN:

```
1 SELECT * FROM students where ROLL_NO IN (8,15,25);
```

Q> What happens when the column is set to AUTO INCREMENT and if you reach maximum value in the table?

It stops incrementing. Any further inserts are going to produce an error, since the key has been used already.

Q> How can we find out which auto increment was assigned on Last insert?

LAST_INSERT_ID will return the last value assigned by Auto_increment and it is not required to specify the table name.

Q> How many TRIGGERS are allowed in MySql table?

SIX triggers are allowed in MySql table. They are as follows:

- BEFORE INSERT
- AFTER INSERT
- BEFORE UPDATE
- AFTER UPDATE
- BEFORE DELETE and
- AFTER DELETE