



# CHRIST

(DEEMED TO BE UNIVERSITY)

PUNE LAVASA CAMPUS  
The Hub of Analytics

**Database Management Systems**

**BDS33L**

**Lab Compilation**

**By**

**Krish Agarwal**

**21112016**

**3BSc DS A**

## Data Manipulation Language

**Program Number: 1**

Date: 30/08/2022 – 03/09/2022

Aim: INSERT, UPDATE, DELETE

```

MySQL 8.0 Command Line Client
Enter password: ****
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.30 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> use lab_two;
ERROR 1049 (42000): Unknown database 'lab_two'
mysql> show databases;
+-----+
| Database      |
+-----+
| information_schema |
| lab2          |
| mysql          |
| performance_schema |
| sys           |
+-----+
5 rows in set (0.02 sec)

mysql> use lab2;
Database changed
mysql> show tables;
+-----+
| Tables_in_lab2 |
+-----+
| table_two      |
| table_two_dup  |
+-----+
2 rows in set (0.02 sec)

mysql> select * from table_two_dup;
Empty set (0.01 sec)

mysql> drop table table_two_dup;
Query OK, 0 rows affected (0.03 sec)

mysql> select * from table_two_dup;
ERROR 1146 (42S02): Table 'lab2.table_two_dup' doesn't exist
mysql> CREATE TABLE table_three AS SELECT * FROM table_two;
Query OK, 3 rows affected (0.04 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from table_three;
+-----+-----+-----+-----+
| PersonID | FirstName | LastName | City    | Designation |
+-----+-----+-----+-----+
| 21112001 | Krish     | Agarwal   | Pune    | Data Science |
| 21112002 | Sakshi    | Modi      | Giridhi | Economics Analytics |
| 21112003 | Sneha     | Gupta     | Jaipur  | Economics Analytics |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

```

```
MySQL 8.0 Command Line Client
mysql> alter table table_three add Address varchar(25);
Query OK, 0 rows affected (0.02 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> select * from table_three;
+-----+-----+-----+-----+-----+-----+
| PersonID | FirstName | LastName | City | Designation | Address |
+-----+-----+-----+-----+-----+-----+
| 21112001 | Krish | Agarwal | Pune | Data Science | NULL |
| 21112002 | Sakshi | Modi | Giridhi | Economics Analytics | NULL |
| 21112003 | Sneha | Gupta | Jaipur | Economics Analytics | NULL |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> update table_three set Address = 'Portofino Street' where city = 'Pune';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> update table_three set Address = 'SP 30' where city = 'Giridhi';
Query OK, 1 row affected (0.00 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> update table_three set Address = 'Portofino Street' where city = 'Jaipur';
Query OK, 1 row affected (0.00 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select * from table_three;
+-----+-----+-----+-----+-----+-----+
| PersonID | FirstName | LastName | City | Designation | Address |
+-----+-----+-----+-----+-----+-----+
```

```
MySQL 8.0 Command Line Client
mysql> describe table_three;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| PersonID | int | YES | | NULL | |
| FirstName | varchar(20) | YES | | NULL | |
| LastName | varchar(20) | YES | | NULL | |
| City | varchar(30) | YES | | NULL | |
| Designation | varchar(25) | YES | | NULL | |
| Address | varchar(25) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.01 sec)

mysql> alter table table_three drop city;
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> select * from table_three;
+-----+-----+-----+-----+-----+
| PersonID | FirstName | LastName | Designation | Address |
+-----+-----+-----+-----+-----+
| 21112001 | Krish | Agarwal | Data Science | Portofino Street |
| 21112002 | Sakshi | Modi | Economics Analytics | SP 30 |
| 21112003 | Sneha | Gupta | Economics Analytics | Portofino Street |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> create table table_three_dup select * from table_three;
Query OK, 3 rows affected (0.04 sec)
Records: 3 Duplicates: 0 Warnings: 0
```

```

MySQL 8.0 Command Line Client

mysql> select * from table_three;
+-----+-----+-----+-----+
| PersonID | FirstName | LastName | Designation | Address |
+-----+-----+-----+-----+
| 21112001 | Krish    | Agarwal   | Data Science | Portofino Street |
| 21112002 | Sakshi    | Modi      | Economics Analytics | SP 30 |
| 21112003 | Sneha    | Gupta     | Economics Analytics | Portofino Street |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> truncate table table_three_dup;
Query OK, 0 rows affected (0.02 sec)

mysql> select * from table_three_dup;
Empty set (0.00 sec)

mysql> drop table table_table_dup;
ERROR 1051 (42S02): Unknown table 'lab2.table_table_dup'
mysql> drop table table_three_dup;
Query OK, 0 rows affected (0.01 sec)

mysql> create table if not exists table_three_dup like table_three;
Query OK, 0 rows affected (0.01 sec)

mysql> select * from table_three_dup;
Empty set (0.00 sec)

mysql> drop table table_three_dup;
Query OK, 0 rows affected (0.01 sec)

MySQL 8.0 Command Line Client

Empty set (0.00 sec)

mysql> drop table table_three_dup;
Query OK, 0 rows affected (0.01 sec)

mysql> rename table_three to lab3;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version
for the right syntax to use near 'table_three to lab3' at line 1
mysql> rename table table_three to Lab3;
Query OK, 0 rows affected (0.02 sec)

mysql> select * from Lab3;
+-----+-----+-----+-----+
| PersonID | FirstName | LastName | Designation | Address |
+-----+-----+-----+-----+
| 21112001 | Krish    | Agarwal   | Data Science | Portofino Street |
| 21112002 | Sakshi    | Modi      | Economics Analytics | SP 30 |
| 21112003 | Sneha    | Gupta     | Economics Analytics | Portofino Street |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> 

```

## SQL Functions

**Program Number: 2**

Date: 07/09/2022 – 28/09/2022

Aim: Concatenation Operator, Column Aliases, String Functions, Arithmetic Functions, Date Function

Experiment Number: 4

```
MySQL 8.0 Command Line Client
Enter password: ****
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.30 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| lab2 |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.04 sec)

mysql> use lab2;
Database changed
mysql> SELECT ASCII(CustomerName) AS NumCodeOfFirstChar
   -> FROM Customers;^C
mysql> select * from lab3;
```

```
MySQL 8.0 Command Line Client
Enter password: ****
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.30 MySQL Community Server - GPL

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owners.

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

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| lab2 |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.04 sec)

mysql> use lab2;
Database changed
mysql> SELECT ASCII(CustomerName) AS NumCodeOfFirstChar
   -> FROM Customers;^C
mysql> select * from lab3;
```

```
MySQL 8.0 Command Line Client
mysql> select * from lab3;
+-----+-----+-----+-----+-----+
| PersonID | FirstName | LastName | Designation | Address |
+-----+-----+-----+-----+-----+
| 21112001 | Krish | Agarwal | Data Science | Portofino Street |
| 21112002 | Sakshi | Modi | BBA LLB | SP 30 |
| 21112003 | Sneha | Gupta | Economics Analytics | Portofino Street |
+-----+-----+-----+-----+
rows in set (0.03 sec)

mysql> select ASCII("Krish");
+-----+
| ASCII("Krish") |
+-----+
| 75 |
+-----+
row in set (0.01 sec)

mysql> char_length("Krish");
RROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'char_length("Krish")' at line 1
mysql> CHAR_LENGTH("KRISH");
RROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'CHAR_LENGTH("KRISH")' at line 1
mysql> Select FirstName,
       -> CHAR_LENGTH(Firstname) as 'Char Length'
       -> from lab3
       -> where CHAR_LENGTH(firstname)>5;
+-----+
| FirstName | Char Length |
+-----+
```

```
MySQL 8.0 Command Line Client
mysql> select personid, CONCAT(firstname, " ", lastname) as FullName
   -> from lab3;
+-----+
| personid | FullName |
+-----+
| 21112001 | Krish Agarwal |
| 21112002 | Sakshi Modi |
| 21112003 | Sneha Gupta |
+-----+
3 rows in set (0.01 sec)

mysql> select personid, concat("-", firstname, lastname) as FullName
   -> from lab3;
+-----+
| personid | FullName |
+-----+
| 21112001 | -KrishAgarwal |
| 21112002 | -SakshiModi |
| 21112003 | -SnehaGupta |
+-----+
3 rows in set (0.00 sec)

mysql> select personid, concat_ws("-", firstname, lastname) as FullName
   -> from lab3;
+-----+
| personid | FullName |
+-----+
| 21112001 | Krish-Agarwal |
| 21112002 | Sakshi-Modi |
+-----+
```

```
MySQL 8.0 Command Line Client

mysql> select field("Krish", firstname);
ERROR 1054 (42S22): Unknown column 'firstname' in 'field list'
mysql> select field("Krish", firstname)
    -> from lab3;
+-----+
| field("Krish", firstname) |
+-----+
| 1 |
| 0 |
| 0 |
+-----+
3 rows in set (0.00 sec)

mysql> SELECT FORMAT(250500.5634, 2);
+-----+
| FORMAT(250500.5634, 2) |
+-----+
| 250,500.56 |
+-----+
1 row in set (0.00 sec)

mysql> select insert("Sneha haha", 1, 5, "Krish");
+-----+
| insert("Sneha haha", 1, 5, "Krish") |
+-----+
| Krish haha |
+-----+
1 row in set (0.00 sec)
```

```
MySQL 8.0 Command Line Client

mysql> select instr("Krish", "r");
+-----+
| instr("Krish", "r") |
+-----+
| 2 |
+-----+
1 row in set (0.01 sec)

mysql> select lcase("YEEEEEEEEEET");
+-----+
| lcase("YEEEEEEEEEET") |
+-----+
| yeeeeeeeeet |
+-----+
1 row in set (0.01 sec)

mysql> select left("Data Science", 4) as String;
+-----+
| String |
+-----+
| Data |
+-----+
1 row in set (0.00 sec)

mysql> select right("Data Science", 4) as String;
+-----+
| String |
+-----+
| ence |
+-----+
```

```
MySQL 8.0 Command Line Client

mysql> select length("Data Science") as Length;
+-----+
| Length |
+-----+
|      12 |
+-----+
1 row in set (0.00 sec)

mysql> select locate("ri", "Krish") as Loc;
+-----+
| Loc |
+-----+
|      2 |
+-----+
1 row in set (0.01 sec)

mysql> select lower("DATA SCIENCE");
+-----+
| lower("DATA SCIENCE") |
+-----+
| data science          |
+-----+
1 row in set (0.00 sec)

mysql> select lpad("Krish Agarwal", "My name is");
ERROR 1582 (42000): Incorrect parameter count in the call to native function 'lpad'
mysql> select lpad("Krish Agarwal", 16,"My name is");
+-----+
| lpad("Krish Agarwal", 16,"My name is") |
+-----+
1 row in set (0.00 sec)
```

```
MySQL 8.0 Command Line Client

mysql> select ltrim("      hi");
+-----+
| ltrim("      hi") |
+-----+
|      hi           |
+-----+
1 row in set (0.01 sec)

mysql> select mid("My name is Khan", 5, 10);
+-----+
| mid("My name is Khan", 5, 10) |
+-----+
|     ame is Kha               |
+-----+
1 row in set (0.00 sec)

mysql> select position("hi" in "himalayas");
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'select position("hi" in "himalayas")' at line 1
mysql> select position("hi" in "himalayas");
+-----+
| position("hi" in "himalayas") |
+-----+
|          1                   |
+-----+
1 row in set (0.01 sec)

mysql> select repeat("DS", 10);
+-----+
```

```

MySQL 8.0 Command Line Client

mysql> select repeat("ha", 10);
+-----+
| repeat("ha", 10) |
+-----+
| hahahahahahahaha |
+-----+
1 row in set (0.00 sec)

mysql> select replace("Je m'appelle Krish", "Krish", "Batman");
+-----+
| replace("Je m'appelle Krish", "Krish", "Batman") |
+-----+
| Je m'appelle Batman |
+-----+
1 row in set (0.00 sec)

mysql> select reverse("GOD");
+-----+
| reverse("GOD") |
+-----+
| DOG |
+-----+
1 row in set (0.00 sec)

mysql> SELECT RIGHT("SQL Tutorial is cool", 4);
+-----+
| RIGHT("SQL Tutorial is cool", 4) |
+-----+
| cool |
+-----+
1 row in set (0.00 sec)

MySQL 8.0 Command Line Client

mysql> SELECT RPAD("Alphabets:", 20, "ABC");
+-----+
| RPAD("Alphabets:", 20, "ABC") |
+-----+
| Alphabets: ABCABCABC |
+-----+
1 row in set (0.00 sec)

mysql> select rtrim("hi      ");
+-----+
| rtrim("hi      ") |
+-----+
| hi |
+-----+
1 row in set (0.00 sec)

mysql> select space('yeet', 4);
ERROR 1582 (42000): Incorrect parameter count in the call to native function 'space'
mysql> select space(4);
+-----+
| space(4) |
+-----+
|        |
+-----+
1 row in set (0.00 sec)

mysql> SELECT STRCMP("SQL Tutorial", "SQL Tutorial");
+-----+
| STRCMP("SQL Tutorial", "SQL Tutorial") |
+-----+
| 0 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT STRCMP("SQL Tutorial", "SQL Tutorial ");
+-----+
| STRCMP("SQL Tutorial", "SQL Tutorial ") |
+-----+
| 0 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT STRCMP("SQL Tutorial", "SQL TUTORIA");
+-----+
| STRCMP("SQL Tutorial", "SQL TUTORIA") |
+-----+
| 1 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT SUBSTR("SQL Tutorial", 5, 3);
-> ;
+-----+
| SUBSTR("SQL Tutorial", 5, 3) |
+-----+
| Tut |
+-----+
1 row in set (0.00 sec)

mysql> SELECT SUBSTRING_INDEX("www.w3schools.com", ".", 3);
+-----+
| SUBSTRING_INDEX("www.w3schools.com", ".", 3) |
+-----+
| www |
+-----+
1 row in set (0.00 sec)

mysql> SELECT TRIM(' SQL Tutorial ');
+-----+
| TRIM(' SQL Tutorial ') |
+-----+
| SQL Tutorial |
+-----+
1 row in set (0.00 sec)

mysql> SELECT UCASE("SQL is FUN!");
+-----+
| UCASE("SQL is FUN!") |
+-----+
| SQL IS FUN! |
+-----+
1 row in set (0.00 sec)

mysql>

```

## Experiment Number: 5

```

MySQL 8.0 Command Line Client
Enter password: *****
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 8.0.30 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> use lab2;
Database changed
mysql> show tables;
+-----+
| Tables_in_lab2 |
+-----+
| lab2           |
| lab3           |
+-----+
2 rows in set (0.04 sec)

mysql> create table lab4
    >     (Name varchar(50), Physics float, Chemistry float, Mathematics float, English float, PhysicalEducation float);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'Education float)' at line 2
mysql> create table lab4
    >     (Name varchar(50), Physics float, Chemistry float, Mathematics float, English float, PhysicalEducation float);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'Name varchar(50), Physics float, Chemistry float, Mathem' at line 1
mysql> create table lab4 (Name varchar(50), Physics float, Chemistry float, Mathematics float, English float, PhysicalEducation float);
Query OK, 0 rows affected (0.05 sec)

mysql> select * from lab4;
Empty set (0.01 sec)

mysql> insert into lab4 values("Krish Agarwal", 98, 90, 98, 98, 98);
Query OK, 1 row affected (0.02 sec)

mysql> select * from lab4;
+-----+-----+-----+-----+-----+-----+
| Name | Physics | Chemistry | Mathematics | English | PhysicalEducation |
+-----+-----+-----+-----+-----+-----+
| Krish Agarwal | 98 | 90 | 98 | 98 | 98 |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> insert into lab4 values("Sneha Gupta", 89, 85, 91, 95, 75);
Query OK, 1 row affected (0.00 sec)

MySQL 8.0 Command Line Client
Enter password: *****
mysql> insert into lab4 values("Sakshi Modi", 84, 89, 82, 92, 84);
Query OK, 1 row affected (0.00 sec)

mysql> select * from lab4;
+-----+-----+-----+-----+-----+-----+
| Name | Physics | Chemistry | Mathematics | English | PhysicalEducation |
+-----+-----+-----+-----+-----+-----+
| Krish Agarwal | 98 | 90 | 98 | 98 | 98 |
| Sneha Gupta | 89 | 85 | 91 | 95 | 75 |
| Sakshi Modi | 84 | 89 | 82 | 92 | 84 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> insert into lab4 values("Shreyans P", 79, 83, 86, 90, 87);
Query OK, 1 row affected (0.02 sec)

mysql> select * from lab4;
+-----+-----+-----+-----+-----+-----+
| Name | Physics | Chemistry | Mathematics | English | PhysicalEducation |
+-----+-----+-----+-----+-----+-----+
| Krish Agarwal | 98 | 90 | 98 | 98 | 98 |
| Sneha Gupta | 89 | 85 | 91 | 95 | 75 |
| Sakshi Modi | 84 | 89 | 82 | 92 | 84 |
| Shreyans P | 79 | 83 | 86 | 90 | 87 |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> select Name, Physics+Chemistry+Mathematics+English+PhysicalEducation as Total from lab4;
+-----+-----+
| Name | Total |
+-----+-----+
| Krish Agarwal | 450 |
| Sneha Gupta | 425 |
| Sakshi Modi | 431 |
| Shreyans P | 425 |
+-----+-----+
4 rows in set (0.01 sec)

mysql> select Name, Physics-Chemistry as Difference from lab4;
+-----+-----+
| Name | Difference |
+-----+-----+
| Krish Agarwal | 0 |
| Sneha Gupta | 4 |
| Sakshi Modi | -3 |
| Shreyans P | -4 |
+-----+-----+
4 rows in set (0.00 sec)

```

### 3 B.Sc Data Science\_ Dec 2022

```

MySQL 8.0 Command Line Client

mysql> select Name, (Physics+Chemistry+Mathematics+English+PhysicalEducation)/500*100 as Percentage from lab4;
+-----+-----+
| Name | Percentage |
+-----+-----+
| Krish Agarwal | 99 |
| Sneha Gupta | 87 |
| Sakshi Modi | 86.2 |
| Shreyans P | 85 |
+-----+-----+
4 rows in set (0.00 sec)

mysql> select Name, (Physics+Chemistry+Mathematics)/300*100 as Main Subjects Percentage from lab4;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'Subjects Percentage from lab4' at line 1
mysql> select Name, (Physics+Chemistry+Mathematics)/300*100 as MainSubjectsPercentage from lab4;
+-----+-----+
| Name | MainSubjectsPercentage |
+-----+-----+
| Krish Agarwal | 99 |
| Sneha Gupta | 88.3333333333333 |
| Sakshi Modi | 86.2 |
| Shreyans P | 82.666666666666667 |
+-----+-----+
4 rows in set (0.00 sec)

mysql> select Name, Physics div Mathematics as PMRatio from lab4;
+-----+-----+
| Name | PMRatio |
+-----+-----+
| Krish Agarwal | 1 |
| Sneha Gupta | 0 |
| Sakshi Modi | 1 |
| Shreyans P | 0 |
+-----+-----+
4 rows in set (0.01 sec)

mysql> select Name, if(Physics<2, "ODD", "EVEN") as PhysicsScore from lab4;
+-----+-----+
| Name | PhysicsScore |
+-----+-----+
| Krish Agarwal | EVEN |
| Sneha Gupta | ODD |
| Sakshi Modi | EVEN |
| Shreyans P | ODD |
+-----+-----+
4 rows in set (0.00 sec)

mysql>

```

  

```

MySQL 8.0 Command Line Client

mysql> select abs(-11*2);
+-----+
| abs(-11*2) |
+-----+
| 22 |
+-----+
1 row in set (0.01 sec)

mysql> select sign(-1);
+-----+
| sign(-1) |
+-----+
| -1 |
+-----+
1 row in set (0.01 sec)

mysql> select sign(1);
+-----+
| sign(1) |
+-----+
| 1 |
+-----+
1 row in set (0.00 sec)

mysql> select sign(0);
+-----+
| sign(0) |
+-----+
| 0 |
+-----+
1 row in set (0.00 sec)

mysql> select sqrt(3211);
+-----+
| sqrt(3211) |
+-----+
| 56.6656862602876 |
+-----+
1 row in set (0.00 sec)

mysql> select sqrt(100);
+-----+
| sqrt(100) |
+-----+
| 10 |
+-----+
1 row in set (0.00 sec)

mysql> select sum(English) as TotalEnglishScores from lab4;
+-----+
| TotalEnglishScores |
+-----+
| 367 |
+-----+
1 row in set (0.00 sec)

mysql>

```

  

```

MySQL 8.0 Command Line Client

mysql> select sum(English) from lab4 where English<85;
+-----+
| sum(English) |
+-----+
| 367 |
+-----+
1 row in set (0.01 sec)

mysql> select sum(English) from lab4 where Mathematics<86;
+-----+
| sum(English) |
+-----+
| 92 |
+-----+
1 row in set (0.00 sec)

mysql> select
    -> truncate(23.458, 2);
+-----+
| truncate(23.458, 2) |
+-----+
| 23.45 |
+-----+
1 row in set (0.00 sec)

mysql> select avg(Physics, Chemistry, Mathematics, English, PhysicalEducation) from lab4 where Name='Krish Agarwal';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near ', Chemistry, Mathematics, English, PhysicalEducation)' from lab4 where Name='Kris'
at line 1
mysql> select avg(Physics, Chemistry, Mathematics, English, PhysicalEducation) from lab4 where Name='Krish Agarwal';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near ', Chemistry, Mathematics, English, PhysicalEducation)' from lab4 where Name='Kris'
at line 1
mysql> select * from lab4;
+-----+-----+-----+-----+-----+
| Name | Physics | Chemistry | Mathematics | English | PhysicalEducation |
+-----+-----+-----+-----+-----+
| Krish Agarwal | 96 | 96 | 98 | 96 | 98 | |
| Sneha Gupta | 89 | 85 | 89 | 91 | 95 | 75 |
| Sakshi Modi | 84 | 89 | 89 | 92 | 92 | 84 |
| Shreyans P | 79 | 83 | 86 | 90 | 87 |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

```

```

MySQL 8.0 Command Line Client
mysql> select avg(Mathematics) from lab4;
+-----+
| avg(Mathematics) |
+-----+
| 87.25 |
+-----+
1 row in set (0.00 sec)

mysql> select ceil(45.56);
+-----+
| ceil(45.56) |
+-----+
| 46 |
+-----+
1 row in set (0.01 sec)

mysql> select count(Name) from lab4;
+-----+
| count(Name) |
+-----+
| 4 |
+-----+
1 row in set (0.00 sec)

mysql> select floor(11.1);
+-----+
| floor(11.1) |
+-----+
| 11 |
+-----+
1 row in set (0.01 sec)

mysql> select Name from lab4 where Name = greatest(Mathematics);
ERROR 1582 (42000): Incorrect parameter count in the call to native function 'greatest'
mysql> select greatest("a", "A");
+-----+
| greatest("a", "A") |
+-----+
| A |
+-----+
1 row in set (0.00 sec)

mysql> Select least("L", "m");
+-----+
| least("L", "m") |
+-----+
| L |
+-----+
1 row in set (0.00 sec)

MySQL 8.0 Command Line Client
mysql> select Name from lab4 where Mathematics = max(Mathematics);
ERROR 1399 (HY000): Invalid use of group function
mysql> select Name from lab4 where Mathematics = (select max(Mathematics) from lab4);
+-----+
| Name |
+-----+
| Sneha Gupta |
+-----+
1 row in set (0.01 sec)

mysql> select Name from lab4 where Mathematics = (select min(Mathematics) from lab4);
+-----+
| Name |
+-----+
| Sakshi Modi |
+-----+
1 row in set (0.00 sec)

mysql> select rand();
+-----+
| rand() |
+-----+
| 0.6598354243364515 |
+-----+
1 row in set (0.01 sec)

mysql> select rand();
+-----+
| rand() |
+-----+
| 0.6134811117866273 |
+-----+
1 row in set (0.00 sec)

mysql> select rand();
+-----+
| rand() |
+-----+
| 0.1144993165742706 |
+-----+
1 row in set (0.00 sec)

MySQL 8.0 Command Line Client
mysql> select Name from lab4 where Mathematics = (select min(Mathematics) from lab4);
+-----+
| Name |
+-----+
| Sakshi Modi |
+-----+
1 row in set (0.00 sec)

mysql> select Name from lab4 where Mathematics = (select min(Mathematics) from lab4);
+-----+
| Name |
+-----+
| Sakshi Modi |
+-----+
1 row in set (0.00 sec)

mysql> select rand();
+-----+
| rand() |
+-----+
| 0.01890743393721513 |
+-----+
1 row in set (0.00 sec)

mysql> select rand();
+-----+
| rand() |
+-----+
| 0.8756495951790489 |
+-----+
1 row in set (0.00 sec)

mysql>

mysql> select abs(Physics) from lab4 where Name = 'Aman Sihag';
+-----+
| abs(Physics) |
+-----+
| 86.5 |
+-----+
1 row in set (0.01 sec)

```

## Experiment Number: 6

```

MySQL 8.0 Command Line Client
Enter password: *****
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.30 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> use lab2;
Database changed
mysql> CREATE TABLE DateAndTime (Time TIME, Date DATE);
Query OK, 0 rows affected (0.03 sec)

mysql> INSERT INTO DateAndTime VALUES ('10:02:52.2','2002-02-10'),("06:19:45.9",'2302-05-17'),('14:05:12','1905-10-15'),('23:59:59','1000-01-01');
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '10:02:52.2','2002-02-10'),("06:19:45.9' at line 1
mysql> INSERT INTO DateAndTime VALUES ('10:02:52','2002-02-10"),("06:19:45","2302-05-17"),('14:05:12','1905-10-15'),('23:59:59','1000-01-03');
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '10:02:52','2002-02-10"),("06:19:45," at line 1
mysql> INSERT INTO DateAndTime VALUES ('10:02:52.2','2002-02-10"),("06:19:45.9",'2302-05-17'),('14:05:12','1905-10-15'),('23:59:59','1000-01-03');
Query OK, 5 rows affected (0.01 sec)
Records: 5 Duplicates: 0 Warnings: 0

mysql> select * from DateAndTime;
+-----+-----+
| Time | Date |
+-----+-----+
| 10:02:52 | 2002-02-10 |
| 06:19:45.9 | 2302-05-17 |
| 14:05:12 | 1905-10-15 |
| 23:59:59 | 1000-01-03 |
+-----+-----+
5 rows in set (0.00 sec)

mysql> select adddate('1905-10-15', 7) AS UPDATED from DateAndTime where Date = '1905-10-15';
+-----+
| UPDATED |
+-----+
| 1905-10-22 |
+-----+
1 row in set (0.00 sec)

Windows PowerShell
Type here to search 97% 35°C ENG 13:50 12-10-2022

```

```

MySQL 8.0 Command Line Client
mysql> ALTER TABLE DateAndTime ADD COLUMN DateandTime TIMESTAMP;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'COLUMN DateandTime TIMESTAMP' at line 1
mysql> ALTER TABLE DateandTime ADD COLUMN DateandTime TIMESTAMP;
Query OK, 0 rows affected (0.01 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> select addtime('06:19:45.9','10:20:30') AS UPDATED from DateAndTime where Time = '06:19:45.9';
Empty set (0.00 sec)

mysql> UPDATE DateandTime SET DateandTime = '2008-05-15 12:00:00' WHERE Time = '10:02:52.2';
Query OK, 1 row affected (0.02 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select*from DateAndTime;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+
| 10:02:52 | 2002-02-10 | 2008-05-15 12:00:00 |
| 06:19:45.9 | 2302-05-17 | NULL |
| 14:05:12 | 1905-10-15 | NULL |
| 23:59:59 | 1000-01-03 | NULL |
+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> SELECT ADDTIME('2008-05-15 13:20:32.50','2 1:39:27.50') AS UPDATED FROM DateAndTime WHERE TIME = '10:02:52.2';
+-----+
| UPDATED |
+-----+
| 2008-05-17 15:00:00 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT CONVERT(TZ('2008-05-15 12:00:00','+00:00','+10:00')) AS UPDATED FROM DateAndTime WHERE DATE = '1000-01-03';
+-----+
| UPDATED |
+-----+
| 2008-05-15 22:00:00 |
+-----+
1 row in set (0.00 sec)

mysql> UPDATE DateandTime SET DATE = CURDATE() WHERE Time = '10:02:52.2';
Query OK, 1 row affected (0.02 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select*from DateandTime;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+

```

```
MySQL 8.0 Command Line Client

mysql> select * from DateAndTime;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+
| 10:02:52 | 2022-10-12 | 2008-05-15 12:00:00 |
| 02:50:06 | 2023-03-05 | NULL |
| 06:19:45 | 2302-05-17 | NULL |
| 14:05:12 | 1905-10-15 | NULL |
| 23:59:59 | 1000-01-03 | NULL |
+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> UPDATE DateAndTime SET TIME = CURRENT_TIME WHERE DATE = curdate();
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select * from DateAndTime;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+
| 13:38:07 | 2022-10-12 | 2008-05-15 12:00:00 |
| 02:50:06 | 2023-03-05 | NULL |
| 06:19:45 | 2302-05-17 | NULL |
| 14:05:12 | 1905-10-15 | NULL |
| 23:59:59 | 1000-01-03 | NULL |
+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> UPDATE DateAndTime SET DateandTime = CURRENT_TIMESTAMP WHERE TIME = '14:05:12';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select * from DateAndTime;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+
| 13:38:07 | 2022-10-12 | 2008-05-15 12:00:00 |
| 02:50:06 | 2023-03-05 | NULL |
| 06:19:45 | 2302-05-17 | NULL |
| 14:05:12 | 1905-10-15 | 2022-10-12 13:38:52 |
| 23:59:59 | 1000-01-03 | NULL |
+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> SELECT CURTIME();
+-----+
| CURTIME() |
+-----+
| 13:39:12 |
+-----+
```

```
MySQL 8.0 Command Line Client

mysql> SELECT DATE_ADD(Date, INTERVAL 10 DAY) AS UPDATED FROM DateAndTime WHERE TIME = '23:59:59';
+-----+
| UPDATED |
+-----+
| 1000-01-13 |
+-----+
1 row in set (0.00 sec)

mysql> select date_format(Date, '%a %b %Y') as formatted_date from DateAndTime;
+-----+
| formatted_date |
+-----+
| Wed 26 Oct 2022 |
| Sun 30 May 1903 |
| Sat 17th May 2002 |
| Sun 15th Oct 1905 |
| Fri 3rd Jan 1000 |
+-----+
5 rows in set (0.00 sec)

mysql> SELECT DATE_SUB('2008-05-15', INTERVAL 10 DAY) as Date_Sub ;
+-----+
| Date_Sub |
+-----+
| 2000-05-05 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT DATE('2008-05-17 11:31:31') as required_DATE;
+-----+
| required_DATE |
+-----+
| 2008-05-17 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT DATEDIFF('2008-05-17 11:31:31','2008-04-28');
+-----+
| DATEDIFF('2008-05-17 11:31:31','2008-04-28') |
+-----+
| 19 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT DAYNAME(Date) AS UPDATED FROM DateAndTime WHERE TIME = '23:59:59';
+-----+
| UPDATED |
+-----+
| Friday |
+-----+
```

```
MySQL 8.0 Command Line Client

mysql> SELECT DAY(Date) AS UPDATED FROM DateAndTime WHERE TIME = '23:59:59';
+-----+
| UPDATED |
+-----+
| 3 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT DAYOFMONTH(Date) AS UPDATED FROM DateAndTime WHERE TIME = '23:59:59';
+-----+
| UPDATED |
+-----+
| 3 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT DAYOFWEEK(Date) AS UPDATED FROM DateAndTime WHERE TIME = '23:59:59';
+-----+
| UPDATED |
+-----+
| 6 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT DAYOFYEAR(Date) AS UPDATED FROM DateAndTime WHERE TIME = '23:59:59';
+-----+
| UPDATED |
+-----+
| 3 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT EXTRACT(YEAR FROM Date) AS UPDATED FROM DateAndTime WHERE TIME = '23:59:59';
+-----+
| UPDATED |
+-----+
| 1000 |
+-----+
1 row in set (0.00 sec)

mysql> INSERT INTO DateAndTime VALUES ("25:25:47",FROM_DAYS(933915),null);
Query OK, 1 row affected (0.00 sec)

mysql> select*from DateAndTime;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+
| 13:38:07 | 2022-10-12 | 2008-05-15 12:00:00 |
| 02:50:06 | 2023-03-03 | NULL |
+-----+-----+-----+
1 row in set (0.00 sec)

Windows Type here to search 97% 35°C ENG 1351 12-10-2022
```

```
MySQL 8.0 Command Line Client

mysql> SELECT GET_FORMAT(DATE,'EUR');
+-----+
| GET_FORMAT(DATE,'EUR') |
+-----+
| %d.%m.%Y |
+-----+
1 row in set (0.00 sec)

mysql> SELECT * FROM DateAndTime WHERE HOUR(Time)>10;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '(Time)>10' at line 1
mysql> SELECT * FROM DateAndTime WHERE HOUR(Time)>10;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+
| 13:38:07 | 2022-10-12 | 2008-05-15 12:00:00 |
| 14:05:12 | 1905-10-15 | 2022-10-12 13:38:52 |
| 23:59:59 | 1000-01-03 | NULL |
| 25:25:47 | 2556-12-21 | NULL |
+-----+-----+-----+
4 rows in set (0.01 sec)

mysql> SELECT LAST_DAY(DateandTime) FROM DateAndTime;
+-----+
| LAST_DAY(DateandTime) |
+-----+
| 2008-05-31 |
| NULL |
| NULL |
| 2022-10-31 |
| NULL |
+-----+
5 rows in set (0.00 sec)

mysql> UPDATE DateAndTime SET DateandTime = LOCALTIME WHERE Time = '06:19:46';
Query OK, 0 rows affected (0.00 sec)
Rows matched: 0 Changed: 0 Warnings: 0

mysql> select*from DateAndTime;
+-----+-----+-----+
| Time | Date | DateandTime |
+-----+-----+-----+
| 13:38:07 | 2022-10-12 | 2008-05-15 12:00:00 |
| 02:50:06 | 2023-03-03 | NULL |
| 06:19:45 | 1982-03-07 | NULL |
| 14:05:12 | 1905-10-15 | 2022-10-12 13:38:52 |
| 23:59:59 | 1000-01-03 | NULL |
| 25:25:47 | 2556-12-21 | NULL |
+-----+-----+-----+
5 rows in set (0.00 sec)

Windows Type here to search 97% 35°C ENG 1351 12-10-2022
```

```
MySQL 8.0 Command Line Client

mysql> UPDATE DateAndTime SET DateandTime = LOCALTIMESTAMP WHERE Time = '02:50:06';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> UPDATE DateAndTime SET DateandTime = NOW() WHERE Time = '23:59:59';
Query OK, 1 row affected (0.00 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> UPDATE DateAndTime SET Date = MAKEDATE(2019,138) WHERE Time = '02:50:06';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'WHERE Time = '02:50:06'' at line 1
mysql> UPDATE DateAndTime SET Date = MAKEDATE(2019,138) WHERE Time = '02:50:06';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> UPDATE DateAndTime SET Time = MAKETIME(15,25,36) WHERE Time = '02:50:06';
Query OK, 1 row affected (0.02 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> SELECT*FROM DateAndTime;
+-----+-----+
| Time | Date |
+-----+-----+
| 13:38:07 | 2022-10-12 12:00:00 | |
| 15:25:36 | 2019-05-18 2022-10-12 13:43:53 |
| 06:19:45 | 2302-05-17 | NULL |
| 14:05:12 | 1905-10-15 2022-10-12 13:38:52 |
| 23:59:59 | 1000-01-03 2022-10-12 13:44:23 |
| 25:25:47 | 2556-12-21 | NULL |
+-----+-----+
6 rows in set (0.00 sec)

mysql> SELECT MICROSECOND('2009-05-18 10:15:21.000423');
+-----+
| MICROSECOND('2009-05-18 10:15:21.000423') |
+-----+
| 423 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT MINUTE('2009-05-18 10:15:21.000423');
+-----+
| MINUTE('2009-05-18 10:15:21.000423') |
+-----+
| 15 |
+-----+
1 row in set (0.00 sec)

mysql> ALTER TABLE DateAndTime ADD COLUMN Month VARCHAR(10);
Query OK, 0 rows affected (0.01 sec)
```

```
MySQL 8.0 Command Line Client

mysql> UPDATE DateAndTime SET Month = MONTHNAME(Date) WHERE Date = Date;
Query OK, 6 rows affected (0.02 sec)
Rows matched: 6 Changed: 6 Warnings: 0

mysql> UPDATE DateAndTime SET DateandTime = FROM_UNIXTIME(1255033470) WHERE Time = '06:19:46';
Query OK, 0 rows affected (0.00 sec)
Rows matched: 0 Changed: 0 Warnings: 0

mysql> SELECT*FROM DateAndTime;
+-----+-----+-----+
| Time | Date | DateandTime | Month |
+-----+-----+-----+
| 13:38:07 | 2022-10-12 12:00:00 | 2022-05-15 12:00:00 | October |
| 15:25:36 | 2019-05-18 2022-10-12 13:43:53 | 2019-05-18 13:43:53 | May |
| 06:19:45 | 2302-05-17 | NULL | May |
| 14:05:12 | 1905-10-15 2022-10-12 13:38:52 | 1905-10-15 13:38:52 | October |
| 23:59:59 | 1000-01-03 2022-10-12 13:44:23 | 1000-01-03 13:44:23 | January |
| 25:25:47 | 2556-12-21 | NULL | December |
+-----+-----+-----+
6 rows in set (0.00 sec)

mysql> SELECT PERIOD_ADD(200905,13);
+-----+
| PERIOD_ADD(200905,13) |
+-----+
| 201006 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT PERIOD_DIFF(200905,200811);
+-----+
| PERIOD_DIFF(200905,200811) |
+-----+
| 6 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT QUARTER('2009-05-18');
+-----+
| QUARTER('2009-05-18') |
+-----+
| 2 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT SEC_TO_TIME(3610);
+-----+
| SEC_TO_TIME(3610) |
+-----+
| 1:00:10 |
+-----+
```

```
MySQL 8.0 Command Line Client

mysql> SELECT SEC_TO_TIME(3610);
+-----+
| SEC_TO_TIME(3610) |
+-----+
| 01:00:10          |
+-----+
1 row in set (0.00 sec)

mysql> SELECT SECOND('21:29:46');
+-----+
| SECOND('21:29:46') |
+-----+
|        46           |
+-----+
1 row in set (0.00 sec)

mysql> SELECT STR_TO_DATE('18_05_2079','%d,%m,%Y');
+-----+
| STR_TO_DATE('18_05_2079','%d,%m,%Y') |
+-----+
| 2079-05-18          |
+-----+
1 row in set (0.01 sec)

mysql> SELECT SUBDATE('2108-05-15', INTERVAL 10 DAY);
+-----+
| SUBDATE('2108-05-15', INTERVAL 10 DAY) |
+-----+
| 2108-05-05          |
+-----+
1 row in set (0.00 sec)

mysql> UPDATE DateAndTime SET DateandTime = SUBTIME('2009-05-18 10:29:43.999999', '19 3:31:18.000002') WHERE Time = '25:25:47';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> SELECT*FROM DateAndTime;
+-----+-----+-----+-----+
| Time | Date | DateandTime | Month |
+-----+-----+-----+-----+
| 13:38:07 | 2022-10-12 | 2008-05-15 12:00:00 | October |
| 15:25:36 | 2019-05-18 | 2022-10-12 13:43:53 | May     |
| 06:19:45 | 2302-05-17 | NULL                | May     |
| 14:05:12 | 1905-10-15 | 2022-10-12 13:38:52 | October |
| 23:59:59 | 1000-01-01 | 2022-10-12 13:44:25 | January |
| 25:25:47 | 2556-12-21 | 2009-04-28 06:58:26 | December|
+-----+-----+-----+-----+
6 rows in set (0.00 sec)

Windows PowerShell Type here to search 97% 35°C ENG 1351 12-10-2022
```

```
MySQL 8.0 Command Line Client

mysql> SELECT SYSDATE();
+-----+
| SYSDATE() |
+-----+
| 2022-10-12 13:48:58 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT TIME_FORMAT('97:15:40','%H %k %h %I %l');
+-----+
| TIME_FORMAT('97:15:40','%H %k %h %I %l') |
+-----+
| 97 97 01 01 1 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT TIME_TO_SEC('05:15:40');
+-----+
| TIME_TO_SEC('05:15:40') |
+-----+
| 18940 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT TIME('2009-05-18 15:45:57.005678');
+-----+
| TIME('2009-05-18 15:45:57.005678') |
+-----+
| 15:45:57.005678 |
+-----+
1 row in set (0.00 sec)

mysql> ALTER TABLE DateAndTime ADD COLUMN Week VARCHAR(10);
Query OK, 0 rows affected (0.02 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> UPDATE DateAndTime SET Week = WEEK(Date) WHERE Date = Date;
Query OK, 6 rows affected (0.02 sec)
Rows matched: 6 Changed: 6 Warnings: 0

mysql> SELECT*FROM DateAndTime;
+-----+-----+-----+-----+-----+
| Time | Date | DateandTime | Month | Week |
+-----+-----+-----+-----+-----+
| 13:38:07 | 2022-10-12 | 2008-05-15 12:00:00 | October | 41 |
| 15:25:36 | 2019-05-18 | 2022-10-12 13:43:53 | May     | 19 |
| 06:19:45 | 2302-05-17 | NULL                | May     | 19 |
| 14:05:12 | 1905-10-15 | 2022-10-12 13:38:52 | October | 42 |
| 23:59:59 | 1000-01-01 | 2022-10-12 13:44:25 | January | 0  |
+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)

Windows PowerShell Type here to search 97% 35°C ENG 1351 12-10-2022
```

```
MySQL 8.0 Command Line Client
mysql> SELECT WEEKDAY('2009-05-19');
+-----+
| WEEKDAY('2009-05-19') |
+-----+
| 1 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT WEEKOFYEAR('2009-05-19');
+-----+
| WEEKOFYEAR('2009-05-19') |
+-----+
| 21 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT YEAR('2009-05-19');
+-----+
| YEAR('2009-05-19') |
+-----+
| 2009 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT YEARWEEK('2009-05-18');
+-----+
| YEARWEEK('2009-05-18') |
+-----+
| 200920 |
+-----+
1 row in set (0.00 sec)

mysql>
```

## Advanced SQL functions

## **Program Number: 3**

Date: 12/10/2022

Aim: Select with UNION, MINUS, INTERSECT

## Handling NULL

## Experiment Number: 7

### 3 B.Sc Data Science\_ Dec 2022

```

MySQL 8.0 Command Line Client
mysql> SELECT * FROM lab7_three WHERE Name IS NULL;
+----+-----+
| id | Name |
+----+-----+
| 1 | NULL |
| 3 | NULL |
+----+-----+
2 rows in set (0.00 sec)

mysql> SELECT * FROM lab7_three WHERE Name IS NOT NULL;
+----+-----+
| id | Name |
+----+-----+
| 2 | Ram |
+----+-----+
1 row in set (0.00 sec)

mysql> CREATE TABLE Customers (customerNumber int PRIMARY KEY, customerName varchar (40), contactLastName varchar(20), contactFirstName varchar(15), phone int(10), addressLine1 varchar(30), addressLine2 varchar(30), city varchar(20), state varchar(6), country varchar(30), salesRepEmployeeNumber int, creditlimit float);
Query OK, 0 rows affected, 2 warnings (0.05 sec)

mysql> CREATE TABLE Employees (employeeNumber int PRIMARY KEY, lastName varchar(20), firstName varchar(15), extension varchar, email varchar(50), officeCode int, reportsTo varchar, jobTitle varchar);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near ', email varchar(50), officeCode int, reportsTo varchar, jobTitle varchar' at line 1
mysql> CREATE TABLE Employees (employeeNumber int PRIMARY KEY, lastName varchar(20), firstName varchar(15), extension varchar, email varchar(50), officeCode int, reportsTo varchar, jobTitle varchar);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near ', email varchar(50), officeCode int, reportsTo varchar, jobTitle varchar' at line 1
mysql> CREATE TABLE Employees (employeeNumber int PRIMARY KEY, lastName varchar(20), firstName varchar(15), extension varchar(20), email varchar(50), officeCode int, reportsTo varchar(20), jobTitle varchar(20));
Query OK, 0 rows affected (0.03 sec)

MySQL 8.0 Command Line Client
mysql> INSERT INTO customers VALUES (1, "Samsung", "Agarwal", "Krish", 9876543210, "B2/308", "Portofino Street", "Lavasa", "Maharashtra", 412112, "India", 100, 346436.43);
ERROR 1264 (22000): Out of range value for column 'phone' at row 1
mysql> INSERT INTO customers VALUES (1, "Samsung", "Agarwal", "Krish", 987654321, "B2/308", "Portofino Street", "Lavasa", "Maharashtra", 412112, "India", 100, 346436.43);
Query OK, 1 row affected (0.02 sec)

mysql> select * from customers;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| customerNumber | customerName | contactLastName | contactFirstName | phone | addressLine1 | addressLine2 | city | state | postalCode | country | salesRepEmployeeNumber | creditlimit |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | Samsung | Agarwal | Krish | 9876543210 | B2/308 | Portofino Street | Lavasa | Maharashtra | 412112 | India | 100 | 346436 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.01 sec)

mysql> INSERT INTO customers VALUES (2, "Apple", "Gupta", "Sneha", 123456789, "C2/308", "Portofino Street", "Lavasa", "Maharashtra", 412112, "India", 101, 80734.43), (3, "Sony", "Meherishi", "Aarushi", 2345678901, "F1/308", "Lavasa", "Maharashtra", 412113, "India", 102, 420953.23);
Query OK, 2 rows affected (0.00 sec)
Records: 2 Duplicates: 0 Warnings: 0

mysql> INSERT INTO customers VALUES (4, "LG", "Modi", "Sakshi", 345678901, "SP30", "Portofino Street", "Lavasa", "Maharashtra", 412112, "India", 103, 893483.34), (5, "Xiaomi", "Chopra", "Gaurika", 456789012, "D2/306", "Portofino Street", "Lavasa", "Maharashtra", 412112, "India", 104, 438024.42);
Query OK, 3 rows affected (0.00 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> select * from customers;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| customerNumber | customerName | contactLastName | contactFirstName | phone | addressLine1 | addressLine2 | city | state | postalCode | country | salesRepEmployeeNumber | creditlimit |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | Samsung | Agarwal | Krish | 9876543210 | B2/308 | Portofino Street | Lavasa | Maharashtra | 412112 | India | 100 | 346436 |
| 2 | Apple | Gupta | Sneha | 123456789 | C2/308 | Portofino Street | Lavasa | Maharashtra | 412112 | India | 101 | 80734.4 |
| 3 | Sony | Meherishi | Aarushi | 234567890 | Hostel | FLAME | Lavale | Maharashtra | 412113 | India | 102 | 420953 |
| 4 | LG | Modi | Sakshi | 345678901 | SP30 | Portofino Street | Lavasa | Maharashtra | 412112 | India | 103 | 893483 |
| 5 | Xiaomi | Chopra | Gaurika | 456789012 | D2/306 | Portofino Street | Lavasa | Maharashtra | 412112 | India | 104 | 438024 |
| 6 | Nokia | Padraha | Shreyansh | 567890123 | Clubview 8/102 | Event Street | Lavasa | Maharashtra | 412112 | India | 105 | 438020 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)

mysql> INSERT INTO employees VALUES (1, "VM", "Harshita", "15/10/2022", "harshita.vm@gmail.com", 412112, "Krish Agarwal", "Analyst");
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO employees VALUES (2, "DM", "Swarnali", "14/10/2022", "swarnali.d@gmail.com", 412113, "Sneha Gupta", "Manager"), (3, "Goyal", "Krish", "13/10/2022", "krish.goyal@gmail.com", 412100, "Aarushi Meherishi", "Data Entry Clerk"), (4, "Sangeeta", "P", "12/10/2022", "p.sangeeta@gmail.com", 412100, "Sakshi Modi", "HR"), (5, "Stephen", "Reiyonna", "11/10/2022", "reiyonna.stephen@gmail.com", 412018, "Gaurika Chopra", "Analyst"), (6, "K", "Ricky", "10/10/2022", "ricky.k@gmail.com", 412113, "Shreyansh Padraha", "Tester");
Query OK, 5 rows affected (0.01 sec)
Records: 5 Duplicates: 0 Warnings: 0

mysql> select * from employees;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| employeeNumber | lastName | firstName | extension | email | officeCode | reportsTo | jobTitle |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | VM | Harshita | 15/10/2022 | harshita.vm@gmail.com | 412112 | Krish Agarwal | Analyst |
| 2 | DM | Swarnali | 14/10/2022 | swarnali.d@gmail.com | 412113 | Sneha Gupta | Manager |
| 3 | Goyal | Krish | 13/10/2022 | krish.goyal@gmail.com | 412100 | Aarushi Meherishi | Data Entry Clerk |
| 4 | Sangeeta | P | 12/10/2022 | p.sangeeta@gmail.com | 412100 | Sakshi Modi | HR |
| 5 | Stephen | Reiyonna | 11/10/2022 | reiyonna.stephen@gmail.com | 412018 | Gaurika Chopra | Analyst |
| 6 | K | Ricky | 10/10/2022 | ricky.k@gmail.com | 412113 | Shreyansh Padraha | Tester |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)

mysql> SELECT CONCAT(CONCAT(employees.firstName, " "), employees.lastName) AS Q1 A,B, C FROM employees
-> UNION
-> SELECT CONCAT(CONCAT(customers.contactFirstName, " "), customers.contactLastName) AS Q1 A,B, C FROM customers;
+-----+-----+-----+
| Q1 A,B, C |
+-----+-----+
| Harshita VM |
| Swarnali DM |
| Krish Goyal |
| Sangeeta P |
| Reiyonna Stephen |
| Ricky K |
| Krish Agarwal |
| Sneha Gupta |
| Aarushi Meherishi |
| Sakshi Modi |
| Gaurika Chopra |
| Shreyansh Padraha |
+-----+-----+
12 rows in set (0.00 sec)

mysql> ALTER TABLE customers RENAME COLUMN contactFirstName TO firstName;
Query OK, 0 rows affected (0.07 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> (SELECT firstName, contactLastName AS "Q1 D" FROM customers) UNION (SELECT firstName, lastName AS "Q1 D" FROM employees) ORDER BY firstName DESC
-> ;
+-----+-----+
| firstName | Q1 D |
+-----+-----+
| Swarnali | DM |
| Sneha | Gupta |
| Shreyansh | Padraha |
| Sakshi | Modi |
| Ricky | P |
| Reiyonna | Stephen |
| P | Sangeeta |
| Krish | Agarwal |
| Harshita | VM |
| Gaurika | Chopra |
| Aarushi | Meherishi |
+-----+-----+
12 rows in set (0.01 sec)

```

```
mysql> CREATE TABLE contacts(customer_id int, firstname varchar(20), lastname varchar(20));
Query OK, 0 rows affected (0.05 sec)

mysql> CREATE TABLE customer(customer_id int,lastname varchar(20), firstname varchar(20));
Query OK, 0 rows affected (0.02 sec)

mysql> ALTER TABLE contacts ADD Number int;
Query OK, 0 rows affected (0.02 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE customer RENAME COLUMN Number TO Salary;
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE contacts RENAME COLUMN Number TO Salary;
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> INSERT INTO customer VALUES (100, "Agarwal", "Krish", 84372), (101, "Gupta", "Sneha", 47398), (102, "Modi", "Sakshi", 79332), (103, "Chopra", "Gaurika", 78434), (104, "Agarwal", "Mahir", 57538);
Query OK, 5 rows affected (0.02 sec)
Records: 5 Duplicates: 0 Warnings: 0

mysql> INSERT INTO contacts VALUES (100, "Agarwal", "Krish", 84372), (101, "Gupta", "Muskan", 68347), (102, "Agarwal", "Panchi", 78434), (103, "Trehan", "Navya", 34857), (104, "DS", "Swarali", 97554);

mysql> SELECT customer_id,firstname, lastname FROM customer WHERE EXISTS (SELECT * FROM customer WHERE Salary>60000);
+-----+-----+-----+
| customer_id | firstname | lastname |
+-----+-----+-----+
| 100 | Krish | Agarwal |
| 101 | Sneha | Gupta |
| 102 | Sakshi | Modi |
| 103 | Gaurika | Chopra |
| 104 | Mahir | Agarwal |
+-----+-----+-----+
5 rows in set (0.02 sec)
```

## Filtering Data using WHERE

Program Number: 4

Date: 15/10/2022

Aim: WHERE Operators, WHERE with keywords and logical operators

Experiment Number: 8

```
mysql> create database HR;
Query OK, 1 row affected (0.02 sec)

mysql> use HR;
Database changed

mysql> CREATE TABLE employees (EMPLOYEE_ID numeric(6) NOT NULL primary key, FIRST_NAME varchar(20) DEFAULT NULL,
-> LAST_NAME varchar(25) NOT NULL, EMAIL varchar(25) NOT NULL, PHONE_NUMBER varchar(20) DEFAULT NULL,
-> HIRE_DATE date NOT NULL, JOB_ID varchar(10) NOT NULL, SALARY decimal(8,2) DEFAULT NULL, COMMISSION_PCT decimal(2,2) DEFAULT NULL,
-> MANAGER_ID numeric(6) DEFAULT NULL, DEPARTMENT_ID numeric(4) DEFAULT NULL);
Query OK, 0 rows affected (0.06 sec)

mysql> CREATE TABLE regions (REGION_ID NUMERIC(6) PRIMARY KEY, REGION_NAME VARCHAR(25));
Query OK, 0 rows affected (0.04 sec)

mysql> CREATE TABLE countries (COUNTRY_ID CHAR(2), COUNTRY_NAME VARCHAR(40), REGION_ID NUMERIC(6));
Query OK, 0 rows affected (0.02 sec)

mysql> CREATE TABLE locations (LOCATION_ID NUMERIC(6), STREET_ADDRESS VARCHAR(25), POSTAL_CODE VARCHAR(12), CITY VARCHAR(30), STATE_PROVINCE VARCHAR(12), COUNTRY_ID CHAR(2));
Query OK, 0 rows affected (0.02 sec)

mysql> CREATE TABLE departments (DEPARTMENT_ID NUMERIC(6), DEPARTMENT_NAME VARCHAR(30), MANAGER_ID NUMERIC(6), LOCATION_ID NUMERIC(6));
Query OK, 0 rows affected (0.01 sec)

mysql> ALTER TABLE countries ADD PRIMARY KEY (COUNTRY_ID);
Query OK, 0 rows affected (0.07 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE locations ADD PRIMARY KEY (LOCATION_ID);
ERROR 1072 (42000): Key column 'LOCATION_ID' doesn't exist in table
mysql> ALTER TABLE departments ADD PRIMARY KEY (DEPARTMENT_ID);
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> select * from employees;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER | HIRE_DATE | JOB_ID | SALARY | COMMISSION_PCT | MANAGER_ID | DEPARTMENT_ID |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 100 | Steven | King | SKING | 515.123.4567 | 2003-06-17 | AD_PRES | 24000.00 | 0.00 | 90 | 90 |
| 101 | Neena | Kochhar | NKOCHHAR | 515.123.4568 | 2005-09-21 | AD_VP | 17000.00 | 0.00 | 100 | 90 |
| 102 | Lex | De Haan | LDEHAAN | 515.123.4569 | 2001-01-13 | AD_VP | 17000.00 | 0.00 | 100 | 90 |
| 103 | Alexander | Hunold | AHUNOLD | 590.423.4567 | 2006-01-03 | IT_PROG | 9000.00 | 0.00 | 102 | 60 |
| 104 | Bruce | Ernst | BERNST | 590.423.4568 | 2007-05-21 | IT_PROG | 6000.00 | 0.00 | 103 | 60 |
| 105 | David | Austin | DAUSTIN | 590.423.4569 | 2005-05-25 | IT_PROG | 4800.00 | 0.00 | 103 | 60 |
| 106 | Valli | Pataballa | VPATABAL | 590.423.4560 | 2006-02-05 | IT_PROG | 4800.00 | 0.00 | 103 | 60 |
| 107 | Diana | Lorentz | DLORENTZ | 515.124.4567 | 2007-02-19 | IT_PROG | 42000.00 | 0.00 | 103 | 60 |
| 108 | Nancy | Greenberg | NGREENBE | 515.124.4568 | 2002-08-17 | FI_MGR | 12000.00 | 0.00 | 101 | 100 |
| 109 | Daniel | Faviet | DFAVIET | 515.124.4169 | 2002-08-16 | FI_ACCOUNT | 9000.00 | 0.00 | 108 | 100 |
| 110 | John | Chen | JCHEN | 515.124.4269 | FI_ACCOUNT | 8200.00 | 0.00 | 108 | 100 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
11 rows in set (0.01 sec)
```

Q15) Write an Oracle SQL query to get the designations (jobs) along with the total number of employees in each designation. The output should contain only those jobs with more than three employees.

```
mysql> INSERT INTO employees VALUES (100,'Steven','King','SKING','515.123.4567',
-> '2003-06-17','AD_PRES',24000.00,0.00,90,90);
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO employees VALUES (101,'Neena','Kochhar','NKOCHHAR','515.123.4568',
-> '2005-09-21','AD_VP',17000.00,0.00,100,90);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO employees VALUES (102,'Lex','De Haan','LDEHAAN','515.123.4569',
-> '2001-01-13','AD_VP',17000.00,0.00,100,90);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO employees VALUES (103,'Alexander','Hunold','AHUNOLD','590.423.4567',
-> '2006-01-03','IT_PROG',9000.00,0.00,102,60);
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO employees VALUES (104,'Bruce','Ernst','BERNST','590.423.4568',
-> '2007-05-21','IT_PROG',6000.00,0.00,103,60);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO employees VALUES (105,'David','Austin','DAUSTIN','590.423.4569',
-> '2005-05-25','IT_PROG',4800.00,0.00,103,60);
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO employees VALUES (106,'Valli','Pataballa','VPATABAL','590.423.4560',
-> '2006-02-05','IT_PROG',4800.00,0.00,103,60);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO employees VALUES (107,'Diana','Lorentz','DLORENTZ','515.124.4567',
-> '2007-02-19','IT_PROG',42000.00,0.00,103,60);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO employees VALUES (108,'Nancy','Greenberg','NGREENBE','515.124.4568',
-> '2002-08-17','FI_MGR',12000.00,0.00,101,100);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO employees VALUES (109,'Daniel','Faviet','DFAVIET','515.124.4169',
-> '2002-08-16','FI_ACCOUNT',9000.00,0.00,108,100);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO employees VALUES (110,'John','Chen','JCHEN','515.124.4269',
-> '2005-09-28','FI_ACCOUNT',8200.00,0.00,108,100);
Query OK, 1 row affected (0.02 sec)
```

```
mysql> SELECT job_id, count(employee_id) as "Number of employees" from employees group by job_id having count(job_id) > 3;
+-----+-----+
| job_id | Number of employees |
+-----+-----+
| IT_PROG | 5 |
+-----+-----+
1 row in set (0.01 sec)
```

**Q14)** Write an Oracle SQL query to get the designations (jobs) along with the total salary for those designations where total salary is more than 50000.

```
mysql> SELECT job_id, sum(salary) as "Total Salary of Designation" from employees group by job_id having sum(salary) > 50000;
Empty set (0.01 sec)
```

**Q13)** Write a Oracle SQL query to get the department number with more than 10 employees in each department.

```
mysql> SELECT department_id, count(department_id) as "Number of Employees" from employees group by department_id having count(*) > 10;
Empty set (0.01 sec)
mysql> SELECT department_id, count(department_id) as "Number of Employees" from employees group by department_id having count(*) > 3;
+-----+-----+
| department_id | Number of Employees |
+-----+-----+
|       60      | 5 |
+-----+-----+
1 row in set (0.00 sec)
```

**Q12)** Write an Oracle SQL query to get the total salary drawn by 'SA\_MAN' working in the department number 80.

```
mysql> SELECT sum(salary) as "Total Salary" from employees where JOB_ID = 'SA_MAN' and DEPARTMENT_ID = 80;
+-----+
| Total Salary |
+-----+
|      NULL    |
+-----+
1 row in set (0.02 sec)
```

**Q11)** Write an Oracle SQL query to get the minimum salary being paid to SA\_MAN.

```
mysql> SELECT min(salary) AS "Minimum Salary" FROM employees WHERE JOB_ID = 'SA_MAN';
+-----+
| Minimum Salary |
+-----+
|      NULL      |
+-----+
1 row in set (0.01 sec)
```

**Q10)** Write an Oracle SQL query to get the maximum salary being paid to department ID.

```
mysql> SELECT MAX(salary) AS "Maximum Salary" FROM employees WHERE DEPARTMENT_ID = 40;
+-----+
| Maximum Salary |
+-----+
|      NULL      |
+-----+
1 row in set (0.00 sec)
```

**Q9)** Write an Oracle SQL query to get the maximum salary being paid to 'ST\_CLERK'.

```
mysql> SELECT MAX(salary) AS "Maximum Salary" FROM employees WHERE JOB_ID = 'ST_CLERK';
-> ;
+-----+
| Maximum Salary |
+-----+
|      NULL      |
+-----+
1 row in set (0.00 sec)
```

**Q8)** Write an Oracle SQL query to get the the first\_name and last\_name of the employees who are not working as 'ST\_CLERK', 'SA\_MAN'; or 'IT\_PROG'.

```
mysql> SELECT first_name, last_name FROM employees WHERE JOB_ID NOT IN ('ST_CLERK', 'SA_MAN', 'IT_PROG');
+-----+-----+
| first_name | last_name |
+-----+-----+
| Steven     | King      |
| Neena     | Kochhar   |
| Lex        | Dongmane |
| Nancy     | Greenberg|
| Daniel     | Faviet    |
| John       | Chen      |
+-----+-----+
6 rows in set (0.00 sec)
```

Q7) Write an Oracle SQL query to get the first\_name and last\_name of the employees who are not working as 'AC\_MGR'.

```
mysql> SELECT first_name, last_name FROM employees WHERE job_id NOT IN('AC_MGR');
+-----+-----+
| first_name | last_name |
+-----+-----+
| Steven     | King      |
| Neena      | Kochhar   |
| Lex        | De Haan    |
| Alexander  | Liang cold |
| Bruce      | Ernst     |
| David      | Austin    |
| Valli      | Pataballa |
| Diana      | Lorentz   |
| Nancy      | Greenberg |
| Daniel      | Faviet    |
| John       | Lammel    |
+-----+-----+
11 rows in set (0.00 sec)
```

Q6) Write an Oracle SQL query to get the first\_name and last\_name of the employees whose first\_name are exactly five characters in length.

```
mysql> SELECT first_name, last_name FROM employees WHERE LENGTH(first_name) = 5;
+-----+-----+
| first_name | last_name |
+-----+-----+
| Neena      | Kochhar   |
| Bruce      | Ernst     |
| David      | Austin    |
| Valli      | Pataballa |
| Diana      | Lorentz   |
| Nancy      | Greenberg |
+-----+-----+
6 rows in set (0.00 sec)
```

## **GROUP BY and GROUP BY HAVING**

Program Number: 5

Date: 16/11/2022

Aim: GROUP function examples, GROUP function with HAVING

## Experiment Number: 9

```
mysql> SELECT Continent, ROUND(AVG(SurfaceArea), 0) FROM country GROUP BY Continent;
+-----+-----+
| Continent | ROUND(AVG(SurfaceArea), 0) |
+-----+-----+
| Asia      | 2898867 |
| North America | 1460325 |
| Europe    | 983489 |
| South America | 638948 |
| Africa    | 795689 |
+-----+-----+
5 rows in set (0.01 sec)
```

### Q1) Create these tables and insert sample data into these tables.

```
mysql> CREATE TABLE Orders (order_id INT PRIMARY KEY, customer_name VARCHAR(30), city VARCHAR(25), order_total DECIMAL(10, 3), date DATETIME);
Query OK, 0 rows affected (0.07 sec)

mysql> CREATE TABLE Product_details (product_id INT PRIMARY KEY, product_name VARCHAR(25));
Query OK, 0 rows affected (0.04 sec)

mysql> CREATE TABLE Order_details (order_id INT, FOREIGN KEY (order_id) REFERENCES Orders(order_id), product_id INT, FOREIGN KEY (product_id) REFERENCES Product_details(product_id));
Query OK, 0 rows affected (0.04 sec)

mysql> DESCRIBE Order_details;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id | int | YES | MUL | NULL |
| product_id | int | YES | MUL | NULL |
+-----+-----+-----+-----+-----+
2 rows in set (0.02 sec)

mysql> DESCRIBE Orders;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id | int | NO | PRI | NULL |
| customer_name | varchar(30) | YES | NULL |
| city | varchar(25) | YES | NULL |
| order_total | decimal(10,3) | YES | NULL |
| date | datetime | YES | NULL |
+-----+-----+-----+-----+-----+
5 rows in set (0.01 sec)

mysql> DESCRIBE Product_details;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| product_id | int | NO | PRI | NULL |
| product_name | varchar(25) | YES | NULL |
+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> INSERT INTO lab2.orders (order_id, customer_name, `city`, `order_total`, `date`) VALUES ('2', 'Shreyansh P', 'Raipur', '98566', '2022-11-16');
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO `lab2`.`orders`(`order_id`, `customer_name`, `city`, `order_total`, `date`) VALUES ('3', 'Gaurika C', 'Delhi', '86435', '2022-11-16');
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO `lab2`.`orders`(`order_id`, `customer_name`, `city`, `order_total`, `date`) VALUES ('4', 'Harshita V', 'Delhi', '78652', '2022-11-16');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO `lab2`.`orders`(`order_id`, `customer_name`, `city`, `order_total`, `date`) VALUES ('5', 'Vanshika S', 'Jaipur', '48455', '2022-11-16');
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO `lab2`.`orders`(`order_id`, `customer_name`, `city`, `order_total`, `date`) VALUES ('6', 'Krish G', 'Lucknow', '76783', '2022-11-16');
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `lab2`.`orders`(`customer_name`, `city`, `order_total`, `date`) VALUES ('Pramila R', 'Lavasa', '75574', '2022-11-16');
ERROR 1364 (HY000): Field 'order_id' doesn't have a default value
mysql> INSERT INTO `lab2`.`orders`(`order_id`, `customer_name`, `city`, `order_total`, `date`) VALUES (7, 'Pramila R', 'Lavasa', '75574', '2022-11-16');
-> ^ZC
mysql> INSERT INTO `lab2`.`orders`(`order_id`, `customer_name`, `city`, `order_total`, `date`) VALUES (7, 'Pramila R', 'Lavasa', '75574', '2022-11-16');
-> ^Z
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '' , 'Pramila R', 'Lavasa', '75574', '2022-11-16')';
^ at line 1
mysql> INSERT INTO `lab2`.`orders`(`order_id`, `customer_name`, `city`, `order_total`, `date`) VALUES (7, 'Pramila R', 'Lavasa', '75574', '2022-11-16');
Query OK, 1 row affected (0.02 sec)
```

### Q2) Display the inserted data.

```
mysql> SELECT * FROM Orders;
+-----+-----+-----+-----+-----+
| order_id | customer_name | city | order_total | date |
+-----+-----+-----+-----+-----+
| 1 | Krish A | Ahmedabad | 46863.000 | 2022-11-16 00:00:00 |
| 2 | Shreyansh P | Raipur | 98566.000 | 2022-11-16 00:00:00 |
| 3 | Gaurika C | Delhi | 86435.000 | 2022-11-16 00:00:00 |
| 4 | Harshita V | Delhi | 78652.000 | 2022-11-16 00:00:00 |
| 5 | Vanshika S | Jaipur | 48455.000 | 2022-11-16 00:00:00 |
| 6 | Krish G | Lucknow | 76783.000 | 2022-11-16 00:00:00 |
| 7 | Pramila R | Lavasa | 75574.000 | 2022-11-16 00:00:00 |
+-----+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

### Q3) Write a command to GROUP data from ORDER's table by CITY to get count of orders from different cities.

```
mysql> SELECT city AS CITY, COUNT(customer_name) AS ORDERS FROM Orders GROUP BY city;
+-----+-----+
| CITY | ORDERS |
+-----+-----+
| Ahmedabad | 1 |
| Raipur | 1 |
| Delhi | 2 |
| Jaipur | 1 |
| Lucknow | 1 |
| Lavasa | 3 |
+-----+-----+
6 rows in set (0.00 sec)
```

Q4) Write a command to GROUP BY city and find the total revenue generated from each city.

```
mysql> SELECT CITY AS CITY, SUM(order_total) AS TOTAL FROM Orders GROUP BY city;
+-----+-----+
| CITY | TOTAL |
+-----+-----+
| Ahmedabad | 46863.000 |
| Raipur | 98565.000 |
| Delhi | 165887.000 |
| Jaipur | 48455.000 |
| Lucknow | 76783.000 |
| Lavasa | 75574.000 |
+-----+-----+
6 rows in set (0.00 sec)
```

Q5) Write a command to find the revenue for all the cities which have a name starting with 'C'.

```
mysql> SELECT SUM(order_total) AS TOTAL FROM Orders WHERE SUBSTR(City, 1, 1) = "L";
+-----+
| TOTAL |
+-----+
| 152357.000 |
+-----+
1 row in set (0.01 sec)
```

Q6) GROUP BY city and revenue numbers of city names beginning with 'S' and the rows are listed by decreasing values of revenue.

```
mysql> SELECT CITY AS CITY, SUM(order_total) AS TOTAL FROM Orders GROUP BY City HAVING SUBSTR(City, 1, 1) = "D" ORDER BY SUM(order_total) DESC;
+-----+-----+
| CITY | TOTAL |
+-----+-----+
| Delhi | 165887.000 |
+-----+-----+
1 row in set (0.00 sec)
```

Q7) Write a command that would return a grouped result for the year 2020, grouped by month. (Grouping using 2 columns).

```
mysql> INSERT INTO Orders VALUES (2, "Teena D", "Ahmedabad", 23758, "2020-04-23");
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO Orders VALUES (9, "Ricky K", "Jaipur", 34658, "2020-05-09");
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO Orders VALUES (10, "Rishabh K", "Lavasa", 35458, "2020-04-05");
Query OK, 1 row affected (0.01 sec)

mysql> SELECT YEAR(date) as Year, MONTH(date) as Month, SUM(order_total) as Total FROM orders
-> GROUP BY Month, Year HAVING Year = '2020' ORDER BY Month DESC;
+-----+-----+-----+
| Year | Month | Total |
+-----+-----+-----+
| 2020 | 5 | 34658.000 |
| 2020 | 4 | 59216.000 |
+-----+-----+
2 rows in set (0.00 sec)
```

Q8) Write a command to display monthly total for all the years (for all months).

```
mysql> SELECT YEAR(date) AS Year, MONTH(date) AS Month,
-> SUM(order_total) AS Revenue FROM orders GROUP BY Month, Year WITH ROLLUP;
+-----+-----+-----+
| Year | Month | Revenue |
+-----+-----+-----+
| 2020 | 4 | 59216.000 |
| NULL | 4 | 59216.000 |
| 2020 | 5 | 34658.000 |
| NULL | 5 | 34658.000 |
| 2022 | 11 | 511328.000 |
| NULL | 11 | 511328.000 |
| NULL | NULL | 685262.000 |
+-----+-----+-----+
7 rows in set (0.03 sec)
```

## Integrity Constraints

Program Number: 6

Date: 23/11/2022

Aim: Types of Constraints, Referral Integrity, Defining Constraints

Experiment Number: 10

### Problem 1

Q1) Create a table "STUDENT" with stu\_id, name and branch as columns. Assign stu\_id as a primary key and it must not contain any null value whereas other attributes may contain null value.

Q2) Insert minimum of 6 records in the above table and display the records.

Q3) Create a table STUDENT\_PL with stu\_id, company\_placed, company\_attended, package with stu\_id as foreign key.

```
mysql> use lab2;
Database changed
mysql> CREATE TABLE STUDENT (Stu_id int(5) PRIMARY KEY NOT NULL, Name VARCHAR(40), Branch VARCHAR(25));
Query OK, 0 rows affected, 1 warning (0.03 sec)

mysql> CREATE TABLE STUDENT_PL (Stu_id INT(5) NOT NULL, FOREIGN KEY (Stu_id) REFERENCES STUDENT(Stu_id), Company_placed VARCHAR(20), Company_attended VARCHAR(20), Package VARCHAR(20));
Query OK, 0 rows affected, 1 warning (0.07 sec)

mysql> describe STUDENT;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key  | Default | Extra |
+-----+-----+-----+-----+-----+
| Stu_id | int    | NO   | PRI  | NULL    |       |
| Name   | varchar | YES  |       | NULL    |       |
| Branch | varchar | YES  |       | NULL    |       |
+-----+-----+-----+-----+-----+
3 rows in set (0.02 sec)

mysql> DESCRIBE STUDENT_PL;
+-----+-----+-----+-----+-----+
| Field      | Type   | Null | Key  | Default | Extra |
+-----+-----+-----+-----+-----+
| Stu_id     | int    | NO   | MUL  | NULL    |       |
| Company_placed | varchar | YES  |       | NULL    |       |
| Company_attended | varchar | YES  |       | NULL    |       |
| Package    | varchar | YES  |       | NULL    |       |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```

mysql> INSERT INTO `lab2`.`student` (`Stu_id`, `Name`, `Branch`) VALUES ('1001', 'Krish Agarwal', 'Pune');
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO `lab2`.`student` (`Stu_id`, `Name`, `Branch`) VALUES ('1002', 'Sneha Gupta', 'Mumbai');
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO `lab2`.`student` (`Stu_id`, `Name`, `Branch`) VALUES ('1003', 'Shreyansh Padraha', 'Thane');
Query OK, 1 row affected (0.02 sec)

mysql> ^C
mysql> INSERT INTO `lab2`.`student` (`Stu_id`, `Name`, `Branch`) VALUES ('1004', 'Gaurika Chopra', 'Mumbai');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO `lab2`.`student` (`Stu_id`, `Name`, `Branch`) VALUES ('1005', 'Mahir Agarwal', 'Ahmedabad');
Query OK, 1 row affected (0.01 sec)

mysql> SELECT * FROM STUDENT;
+-----+-----+
| Stu_id | Name      | Branch   |
+-----+-----+
| 1001  | Krish Agarwal | Pune     |
| 1002  | Sneha Gupta    | Mumbai   |
| 1003  | Shreyansh Padraha | Thane    |
| 1004  | Gaurika Chopra | Mumbai   |
| 1005  | Mahir Agarwal | Ahmedabad |
+-----+-----+
5 rows in set (0.00 sec)

```

Q4) Prove that if there is a foreign key exists in a relation then either the foreign key value must match a primary key value of some tuple in its home relation or the foreign key value must be null.

```

mysql> INSERT INTO STUDENT_PL VALUES (1007, 'Samsung', 'Apple', 'Displays')
-> ;
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('lab2`.`student_pl', CONSTRAINT `student_pl_ibfk_1` FOREIGN KEY (`Stu_id`) REFERENCES `student` (`Stu_id`))

```

Q5) Check if you can delete a record from a primary table if matching records exist in a related table with proven results.

```

mysql> DELETE FROM STUDENT WHERE Stu_id = 1001;
ERROR 1451 (23000): Cannot delete or update a parent row: a foreign key constraint fails ('lab2`.`student_pl', CONSTRAINT `student_pl_ibfk_1` FOREIGN KEY (`Stu_id`) REFERENCES `student` (`Stu_id`))

```

Q6) Check if you can change a primary key value in the primary table if that record has related records with proven results.

```

mysql> UPDATE STUDENT SET Stu_id = 1006 WHERE Branch = 'Ahmedabad';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT * FROM STUDENT;
+-----+-----+
| Stu_id | Name      | Branch   |
+-----+-----+
| 1001  | Krish Agarwal | Pune     |
| 1002  | Sneha Gupta    | Mumbai   |
| 1003  | Shreyansh Padraha | Thane    |
| 1004  | Gaurika Chopra | Mumbai   |
| 1006  | Mahir Agarwal | Ahmedabad |
+-----+-----+
5 rows in set (0.00 sec)

```

Q7) Check if you can enter a value in the foreign key field of the related table that doesn't exist in the primary key of the primary table.

```
mysql> INSERT INTO STUDENT_PL VALUES (1007, 'Samsung', 'Apple', 'Displays')
      ;
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('lab2`.`student_pl', CONSTRAINT `student_pl_ibfk_1` FOREIGN KEY (`Stu_id`) REFERENCES `student` (`Stu_id`))
```

Q8) Check if you can enter a Null value in the foreign key, specifying that the records are unrelated.

```
mysql> INSERT INTO STUDENT_PL VALUES (NULL, 'Huawei', 'Honor', 'Interface');
ERROR 1048 (23000): Column 'Stu_id' cannot be null
```

## Problem 2

Q1) Create an employee table with empid(primary key) ,empname(not null), empcity(not null), emp\_phone(unique)

```
mysql> CREATE TABLE Employee (Emp_id int(5) PRIMARY KEY, Emp_name VARCHAR(30) NOT NULL, Emp_city VARCHAR(20) NOT NULL, Emp_phone int(11) UNIQUE);
Query OK, 0 rows affected, 2 warnings (0.03 sec)
```

Q2) Create another table employee\_pay with emp\_id(foreign key),position, hiredate, payrate.

```
mysql> CREATE TABLE Employee_pay (Emp_id int(5), CONSTRAINT emp_id_fk FOREIGN KEY (Emp_id) REFERENCES Employee(Emp_id), Position VARCHAR(15), Hire_date DATE, Pay_rate decimal);
Query OK, 0 rows affected, 1 warning (0.05 sec)
```

Q3) Check if you can insert null value into empid in employee table and in employee\_pay.

```
mysql> INSERT INTO Employee VALUES (NULL, 'Krish Agarwal' , 'Ahmedabad' , 9876543210);
ERROR 1048 (23000): Column 'Emp_id' cannot be null
mysql> INSERT INTO Employee_pay VALUES (NULL, 'Analyst', '2022-11-01', 70000);
Query OK, 1 row affected (0.01 sec)
```

Q4) Try to drop a primary key constraint from employee table and insert null and duplicate values into empid.

```
mysql> ALTER TABLE Employee_pay DROP CONSTRAINT emp_id_fk;
Query OK, 0 rows affected (0.04 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE Employee DROP PRIMARY KEY;
Query OK, 0 rows affected (0.08 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT INTO Employee VALUES (NULL, 'Mahir Agarwal', 'Pune', 8765432109);
ERROR 1048 (23000): Column 'Emp_id' cannot be null
mysql> INSERT INTO Employee VALUES (1000, 'Sneha Gupta', 'Jaipur', 765432109);
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO Employee VALUES (1000, 'Shreyansh Padraha', 'Raipur', 654321098);
Query OK, 1 row affected (0.01 sec)
```

Q5) Alter the table employee to set emp\_id as primary key and record the results.

```
mysql> UPDATE employee SET Emp_id = 1001 WHERE Emp_name = 'Shreyansh Padraha';
Query OK, 1 row affected (0.02 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> SELECT * FROM Employee;
+-----+-----+-----+
| Emp_id | Emp_name      | Emp_city | Emp_phone |
+-----+-----+-----+
| 1000  | Sneha Gupta    | Jaipur   | 765432109 |
| 1001  | Shreyansh Padraha | Raipur   | 654321098 |
+-----+-----+-----+
2 rows in set (0.01 sec)
```

```
mysql> ALTER TABLE Employee ADD CONSTRAINT Emp_id_pk PRIMARY KEY (Emp_id);
Query OK, 0 rows affected (0.14 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> describe Employee;
+-----+-----+-----+-----+-----+
| Field   | Type    | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| Emp_id  | int     | NO   | PRI | NULL    |       |
| Emp_name | varchar(30) | NO   |     | NULL    |       |
| Emp_city | varchar(20) | NO   |     | NULL    |       |
| Emp_phone | int     | YES  | UNI | NULL    |       |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Q6) Try to insert null values into emp\_phone and record the results.

```
mysql> INSERT INTO Employee VALUES (1002, 'Krish Agarwal', 'Ahmedabad', NULL);
Query OK, 1 row affected (0.02 sec)
```

```
mysql> SELECT * FROM Employee;
+-----+-----+-----+
| Emp_id | Emp_name      | Emp_city | Emp_phone |
+-----+-----+-----+
| 1000  | Sneha Gupta    | Jaipur   | 765432109 |
| 1001  | Shreyansh Padraha | Raipur   | 654321098 |
| 1002  | Krish Agarwal  | Ahmedabad |      NULL  |
+-----+-----+-----+
3 rows in set (0.00 sec)
```

Q7) Alter employee\_pay and add phone\_no column.

```
mysql> ALTER TABLE Employee_pay ADD phone_no int(11);
Query OK, 0 rows affected, 1 warning (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 1

mysql> SELECT * FROM Employee_pay;
+-----+-----+-----+-----+
| Emp_id | Position | Hire_date | Pay_rate | phone_no |
+-----+-----+-----+-----+
|    NULL | Analyst  | 2022-11-01 |     70000 |      NULL |
+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

Q8) Alter employee\_pay and make phone\_no as foreign key and record the results.

```
mysql> ALTER TABLE employee_pay ADD CONSTRAINT phone_no_fk FOREIGN KEY (phone_no) REFERENCES Employee(Emp_phone);
Query OK, 1 row affected (0.05 sec)
Records: 1  Duplicates: 0  Warnings: 0

mysql> describe employee_pay;
+-----+-----+-----+-----+-----+
| Field   | Type    | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| Emp_id  | int     | YES  | MUL | NULL    |       |
| Position | varchar(15) | YES  |      | NULL    |       |
| Hire_date | date    | YES  |      | NULL    |       |
| Pay_rate | decimal(10,0) | YES  |      | NULL    |       |
| phone_no | int     | YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

--- End ---