

ASSIGNMENT - 1

Ques 1.

You'll have to come up with SQL queries for the following database schema:

Artists (ArtistID: int, Sname: varchar(255), Location: varchar(255))

Tracks (trackID: int, artistID: int, Tname: varchar(255), length: int)

All primary keys are underlined. All foreign keys have the same name as the primary key that they are referencing. Database state for this schema is given below.

Artist State:

<u>ArtistID</u>	Sname	Location
1001	Alla Rakha Rehman	Chennai
1002	Kailas Kher	Delhi
1003	Rahul Dev Barman	Kolkata
1004	Lucky Ali	Mumbai

Tracks State:

<u>TrackID</u>	ArtistID	Tname	Length(min)
10	1001	Bande Matram	6
11	1002	Alla Ke Bande	10
12	1003	Raste Apni Jagah	12
13	1003	Kahi Door Jab	5
14	1001	Maa Tujhe Salaam	8
15	1002	Teri Dewani	6
16	1003	Ak Rasta Hai	7

- **Creation and Use of Database**

```
MySQL 8.0 Command Line Cli x + v - □ x

mysql> CREATE DATABASE DEV;
Query OK, 1 row affected (0.10 sec)

mysql> USE DEV;
Database changed
mysql>
```

- **Creation of Table - ARTISTS**

```
MySQL 8.0 Command Line Cli x + v - □ x

mysql> CREATE TABLE ARTISTS
    -> (ArtistID int, SName varchar(255), Location varchar(255));
Query OK, 0 rows affected (0.20 sec)

mysql> DESC ARTISTS;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ArtistID   | int           | YES  |     | NULL    |       |
| SName      | varchar(255)  | YES  |     | NULL    |       |
| Location    | varchar(255)  | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.07 sec)

mysql> alter table artists
    -> add constraint primary key(ArtistID);
Query OK, 0 rows affected (0.13 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc artists;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ArtistID   | int           | NO   | PRI | NULL    |       |
| SName      | varchar(255)  | YES  |     | NULL    |       |
| Location    | varchar(255)  | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> |
```

- Insertion of records into the table - Artists

```
MySQL 8.0 Command Line Cli x + v
mysql> INSERT INTO Artists values
-> (1001,'Alla Rakha Rehman','Chennai'),
-> (1002,'Kailas Kher','Delhi'),
-> (1003,'Rahul Dev Barman','Kolkata'),
-> (1004,'Lucky Ali','Mumbai');
Query OK, 4 rows affected (0.01 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> SELECT * from ARTISTS;
+-----+-----+-----+
| ArtistID | Sname          | Location |
+-----+-----+-----+
| 1001     | Alla Rakha Rehman | Chennai  |
| 1002     | Kailas Kher       | Delhi    |
| 1003     | Rahul Dev Barman  | Kolkata  |
| 1004     | Lucky Ali         | Mumbai   |
+-----+-----+-----+
4 rows in set (0.00 sec)
```

- Creation of Table - TRACKS

```
MySQL 8.0 Command Line Cli x + v
mysql> CREATE TABLE Tracks
-> (TrackID int primary key,ArtistID int,Tname varchar(255),Length int);
Query OK, 0 rows affected (0.01 sec)

mysql> desc tracks;
+-----+-----+-----+-----+-----+-----+
| Field | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| TrackID | int       | NO   | PRI | NULL    |       |
| ArtistID | int       | YES  |     | NULL    |       |
| Tname   | varchar(255) | YES  |     | NULL    |       |
| Length  | int       | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> alter table tracks
-> add foreign key(ArtistID) references Artists(ArtistID);
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> desc tracks;
+-----+-----+-----+-----+-----+-----+
| Field | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| TrackID | int       | NO   | PRI | NULL    |       |
| ArtistID | int       | YES  | MUL | NULL    |       |
| Tname   | varchar(255) | YES  |     | NULL    |       |
| Length  | int       | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
```

- Insertion of records into the table - Tracks

```
MySQL 8.0 Command Line Cli x + v
mysql> INSERT INTO TRACKS VALUES
    -> (10,1001,'Bande Matram',6),
    -> (11,1002,'Allah Ke Bande',10),
    -> (12,1003,'Raste Apni Jagah',12),
    -> (13,1003,'Kahi Door Jab',5),
    -> (14,1001,'Maa Tujhe Salaam',8),
    -> (15,1002,'Teri Dewani',6),
    -> (16,1003,'Ak Rasta Hai',7);
Query OK, 7 rows affected (0.00 sec)
Records: 7 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM TRACKS;
+-----+-----+-----+-----+
| TrackID | ArtistID | Tname          | Length |
+-----+-----+-----+-----+
| 10      | 1001     | Bande Matram   | 6       |
| 11      | 1002     | Allah Ke Bande | 10      |
| 12      | 1003     | Raste Apni Jagah | 12     |
| 13      | 1003     | Kahi Door Jab  | 5       |
| 14      | 1001     | Maa Tujhe Salaam | 8      |
| 15      | 1002     | Teri Dewani    | 6       |
| 16      | 1003     | Ak Rasta Hai   | 7       |
+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

Write SQL statements for the following queries :

1. Find the names of all Tracks that are more than 10 minutes long.

```
MySQL 8.0 Command Line Cli x + v
mysql> select Tname from Tracks
-> where length>10;
+-----+
| Tname |
+-----+
| Raste Apni Jagah |
+-----+
1 row in set (0.00 sec)
```

2. Find the Artists (name) who have recorded more than two tracks.

```
MySQL 8.0 Command Line Cli x + v
mysql> select Sname from artists
-> where artistID in
-> (Select artistID from tracks
-> group by artistID having count(*)>2);
+-----+
| Sname |
+-----+
| Rahul Dev Barman |
+-----+
1 row in set (0.01 sec)
```

3. Find the Artists (name) who have recorded a Track named “Bande Mataram”.

```
MySQL 8.0 Command Line Cli x + v
mysql> select Sname from Artists,Tracks
-> where artists.artistID=Tracks.ArtistID
-> and Tname='Bande Matram';
+-----+
| Sname |
+-----+
| Alla Rakha Rehman |
+-----+
1 row in set (0.00 sec)
```

4. Find the Artists (name) who have not recorded any song.

```
MySQL 8.0 Command Line Cli x + v
mysql> Select Sname from Artists
-> where ArtistID not in
-> (Select Distinct(ArtistID) from Tracks);
+-----+
| Sname |
+-----+
| Lucky Ali |
+-----+
1 row in set (0.01 sec)
```

5. Find the Artist (name) who has recorded the longest song.

```
MySQL 8.0 Command Line Cli x + v
mysql> select sname from artists,tracks
      -> where artists.artistID=Tracks.ArtistID
      -> and length=(Select max(Length) from Tracks);
+-----+
| sname |
+-----+
| Rahul Dev Barman |
+-----+
1 row in set (0.00 sec)
```

ASSIGNMENT - 2

Ques 2

Consider the following relational schema. An employee can work in more than one department; the pct_timefiled of the Works relation shows the percentage of time that a given employee works in a given department.

Emp(eid: integer, ename: string, age: integer, salary: real)

Works(eid: integer, did: integer, pct_time: integer)

Dept(did: integer, dname: string, budget: real, managerid: integer)

Database state for the above schema is below.

Emp State

Eid	Ename	Age	Salary
1001	Sabeer Bhatia	60	50,000
1002	Pranav Mistry	65	55,000
1003	Sam Pitroda	50	60,000
1004	Mark Zukarbarge	50	35,000
1005	Larry Page	40	45,000
1006	Steve Ballmar	45	46,000
1007	Tim Cook	80	65,000

Works State

Eid	Did	Pct_time(percentage of time given in department)
1001	10	20
1002	20	30
1004	40	15
1005	40	50
1003	30	80
1006	60	35
1005	50	40
1001	20	15

Department State

Did	Dname	budget	ManagerId
10	Hard ware	10,000	1001
20	Software	20,000	1002
30	Quality Assurance	30,000	1003
40	Development	15,000	1004
50	Human Resources	40,000	1005
60	Support	12,000	1006

Creation of Table - Emp

```
MySQL 8.0 Command Line Cli x + v
mysql> USE dev;
Database changed
mysql> create table emp
-> (Eid int Primary Key, Ename varchar(255), Age int, Salary decimal);
Query OK, 0 rows affected (0.16 sec)

mysql> DESC emp;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Eid   | int           | NO   | PRI | NULL    |       |
| Ename | varchar(255)  | YES  |     | NULL    |       |
| Age   | int           | YES  |     | NULL    |       |
| Salary | decimal(10,0) | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.02 sec)

mysql>
```

Insertion of records into the table - Emp

```
MySQL 8.0 Command Line Cli x + v
mysql> INSERT INTO Emp VALUES
-> (1001,'Sabeer Bhatia',60,50000),
-> (1002,'Pranav Mistry',65,55000),
-> (1003,'Sam Pitroda',50,60000),
-> (1004,'Mark Zukarbarge',50,35000),
-> (1005,'Larry Page',40,45000),
-> (1006,'Steve Ballmar',45,46000),
-> (1007,'Tim Cook',80,65000);
Query OK, 7 rows affected (0.01 sec)
Records: 7 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Emp;
+-----+-----+-----+-----+
| Eid | Ename          | Age | Salary |
+-----+-----+-----+-----+
| 1001 | Sabeer Bhatia | 60  | 50000  |
| 1002 | Pranav Mistry | 65  | 55000  |
| 1003 | Sam Pitroda   | 50  | 60000  |
| 1004 | Mark Zukarbarge | 50  | 35000  |
| 1005 | Larry Page    | 40  | 45000  |
| 1006 | Steve Ballmar | 45  | 46000  |
| 1007 | Tim Cook      | 80  | 65000  |
+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```


Creation of Table - Dept

```
MySQL 8.0 Command Line CLI x + v

mysql> create table Dept
-> (Did int Primary Key,Dname varchar(255),budget decimal,ManagerID int);
Query OK, 0 rows affected (0.01 sec)

mysql> DESC Dept;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Did   | int  | NO   | PRI | NULL    |       |
| Dname | varchar(255) | YES |     | NULL    |       |
| budget | decimal(10,0) | YES |     | NULL    |       |
| ManagerID | int | YES |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Insertion of records into the table - Dept

```
MySQL 8.0 Command Line CLI x + v

mysql> INSERT INTO Dept VALUES
-> (10,'Hard ware',10000,1001),
-> (20,'Software',20000,1002),
-> (30,'Quality Assurance',30000,1003),
-> (40,'Development',15000,1004),
-> (50,'Human Resources',40000,1005),
-> (60,'Support',12000,1006);
Query OK, 6 rows affected (0.00 sec)
Records: 6 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Dept;
+-----+-----+-----+-----+
| Did | Dname | budget | ManagerID |
+-----+-----+-----+-----+
| 10 | Hard ware | 10000 | 1001 |
| 20 | Software | 20000 | 1002 |
| 30 | Quality Assurance | 30000 | 1003 |
| 40 | Development | 15000 | 1004 |
| 50 | Human Resources | 40000 | 1005 |
| 60 | Support | 12000 | 1006 |
+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

Creation of Table - Works

```
MySQL 8.0 Command Line CLI x + v

mysql> CREATE TABLE Works
-> (Eid int,Did int,Pct_time int);
Query OK, 0 rows affected (0.02 sec)

mysql> DESC Works;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Eid   | int  | YES  |     | NULL    |       |
| Did   | int  | YES  |     | NULL    |       |
| Pct_time | int | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> Alter table Works
-> add foreign key(Eid) references Emp(Eid);
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> Alter table Works
-> add foreign key(Did) references Dept(Did);
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> DESC Works;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Eid   | int  | YES  | MUL | NULL    |       |
| Did   | int  | YES  | MUL | NULL    |       |
| Pct_time | int | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

Insertion of records into the table - Works

```
MySQL 8.0 Command Line CLI x + v
mysql> INSERT INTO Works Values
-> (1001,10,20),
-> (1002,20,30),
-> (1004,40,15),
-> (1005,40,50),
-> (1003,30,80),
-> (1006,60,35),
-> (1005,50,40),
-> (1001,20,15);
Query OK, 8 rows affected (0.00 sec)
Records: 8 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Works;
+----+----+-----+
| Eid | Did | Pct_time |
+----+----+-----+
| 1001 | 10  | 20       |
| 1002 | 20  | 30       |
| 1004 | 40  | 15       |
| 1005 | 40  | 50       |
| 1003 | 30  | 80       |
| 1006 | 60  | 35       |
| 1005 | 50  | 40       |
| 1001 | 20  | 15       |
+----+----+-----+
8 rows in set (0.00 sec)
```

Write SQL statements for the following queries :

1. Find the name of the employee whose name contains two 'a'.

```
MySQL 8.0 Command Line Cli x + v
mysql> select Ename from Emp
-> where Ename like '%a%a%';
+-----+
| Ename |
+-----+
| Sabeer Bhatia |
| Pranav Mistry |
| Sam Pitroda   |
| Mark Zukarbage |
| Larry Page    |
| Steve Ballmar  |
+-----+
6 rows in set (0.01 sec)
```

2. Print the names and ages of each employee who works in both the Hardware department and the Software department.

```
MySQL 8.0 Command Line Cli x + v
mysql> select ename,age from emp
-> where eid=(select eid from works where did in (10,20)
-> group by eid having count(distinct did)=2);
+-----+-----+
| ename | age |
+-----+-----+
| Sabeer Bhatia | 60 |
+-----+-----+
1 row in set (0.00 sec)
```

3. Print them together with the number of employees that work in that department.

```
MySQL 8.0 Command Line Cli x + v
mysql> select did,count(eid) from works group by did;
+-----+-----+
| did | count(eid) |
+-----+-----+
| 10 | 1 |
| 20 | 2 |
| 30 | 1 |
| 40 | 2 |
| 50 | 1 |
| 60 | 1 |
+-----+-----+
6 rows in set (0.00 sec)
```

4. Find the name of employees who do not manage any department.

```
MySQL 8.0 Command Line CLI x + v
mysql> SELECT Ename from Emp
-> where Eid not in (Select Distinct(ManagerID) from Dept);
+-----+
| Ename |
+-----+
| Tim Cook |
+-----+
1 row in set (0.00 sec)
```

5. Find the name of employees who work in the department with the largest budget.

```
MySQL 8.0 Command Line CLI x + v
mysql> SELECT Ename from Emp
-> where Eid=(Select ManagerID from Dept
-> where budget=(Select max(budget) from dept));
+-----+
| Ename |
+-----+
| Larry Page |
+-----+
1 row in set (0.00 sec)
```