1. **Import University database into your MariaDB.**

```
C:\Users\prudhvi chandra>mysql -u root -p university < createuniversity.sql
Enter password: ********

C:\Users\prudhvi chandra>
```

```
MariaDB [university]> show tables;
+----------------------+
| Tables_in_university |
+----------------------+
| advisor              |
| classroom            |
| course               |
| department           |
| instructor           |
| prereq               |
| section              |
| student              |
| takes                |
| teaches              |
| time_slot            |
+----------------------+
11 rows in set (0.051 sec)

MariaDB [university]>
```

Importing create_university dump file into MariaDB university database using mysql command and showing all its tables

2. **Insert data into the student and department table without violating foreign key constraints.**

   Department names should be (Mtech DS, Mtech SOCD, Mtech COM and Mtech Geo)

```
MariaDB [university]> describe student;
+-----------+--------------+------+-----+---------+-------+
| Field     | Type         | Null | Key | Default | Extra |
+-----------+--------------+------+-----+---------+-------+
| ID        | varchar(5)   | NO   | PRI |         |       |
| name      | varchar(20)  | NO   |     | NULL    |       |
| dept_name | varchar(20)  | YES  | MUL | NULL    |       |
| tot_cred  | decimal(3,0) | YES  |     | NULL    |       |
+-----------+--------------+------+-----+---------+-------+
4 rows in set (0.133 sec)

MariaDB [university]> describe department;
+-----------+---------------+------+-----+---------+-------+
| Field     | Type          | Null | Key | Default | Extra |
+-----------+---------------+------+-----+---------+-------+
| dept_name | varchar(20)   | NO   | PRI |         |       |
| building  | varchar(15)   | YES  |     | NULL    |       |
| budget    | decimal(12,2) | YES  |     | NULL    |       |
+-----------+---------------+------+-----+---------+-------+
3 rows in set (0.015 sec)

MariaDB [university]>
```

   Showing table structure and its description with describe command so we can insert data accordingly

```
MariaDB [university]> insert into department(dept_name,building,budget) values("Mtech DS","abc",100000),("Mtech COM","bcd",150000),("Mtech Geo","cde",175000),
    -> ("Mtech SOCD","def",200000);
Query OK, 4 rows affected (0.082 sec)
Records: 4  Duplicates: 0  Warnings: 0

MariaDB [university]> insert into student(ID,name,dept_name,tot_cred) values(100,"priya","Mtech DS",30),(101,"hari","Mtech COM",28),(102,"ram","Mtech Geo",26);
Query OK, 3 rows affected (0.062 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [university]> select * from student;
+-----+-------+-----------+----------+
| ID  | name  | dept_name | tot_cred |
+-----+-------+-----------+----------+
| 100 | priya | Mtech DS  |       30 |
| 101 | hari  | Mtech COM |       28 |
| 102 | ram   | Mtech Geo |       26 |
+-----+-------+-----------+----------+
3 rows in set (0.000 sec)

MariaDB [university]> select * from department;
+------------+----------+-----------+
| dept_name  | building | budget    |
+------------+----------+-----------+
| Mtech COM  | bcd      | 150000.00 |
| Mtech DS   | abc      | 100000.00 |
| Mtech Geo  | cde      | 175000.00 |
| Mtech SOCD | def      | 200000.00 |
+------------+----------+-----------+
4 rows in set (0.000 sec)
```

Student table is having a foreign key to department table, to maintain the foreign key constraints we need to insert values into department table first and then into student table

3. **Retrieve all student names of Mtech DS Department.**

```
MariaDB [university]> select name from student where dept_name="Mtech DS";
+-------+
| name  |
+-------+
| priya |
+-------+
1 row in set (0.098 sec)

MariaDB [university]>
```

I have used where clause to match the department name and then retrieve all students in that department

4. **Retrieve each department topper's name. (Assume tot_cred means cgpa).**

```
MariaDB [university]> select * from student;
+-----+---------+------------+----------+
| ID  | name    | dept_name  | tot_cred |
+-----+---------+------------+----------+
| 100 | priya   | Mtech DS   |       30 |
| 101 | hari    | Mtech COM  |       28 |
| 102 | ram     | Mtech Geo  |       26 |
| 103 | revant  | Mtech DS   |       30 |
| 104 | rishi   | Mtech COM  |       28 |
| 105 | roshan  | Mtech Geo  |       26 |
| 106 | roshini | Mtech DS   |       34 |
| 107 | rohini  | Mtech SOCD |       36 |
| 108 | raj     | Mtech SOCD |       32 |
+-----+---------+------------+----------+
9 rows in set (0.000 sec)

MariaDB [university]> select name,max(tot_cred),dept_name from student group by dept_name;
+--------+---------------+------------+
| name   | max(tot_cred) | dept_name  |
+--------+---------------+------------+
| hari   |            28 | Mtech COM  |
| priya  |            34 | Mtech DS   |
| ram    |            26 | Mtech Geo  |
| rohini |            36 | Mtech SOCD |
+--------+---------------+------------+
4 rows in set (0.000 sec)
```

Initially table didn't have many values for each branch, so I updated some values for them. Here I have used group by with dept_name and selected students with max credits along with their department

5. **Write a view that can retrieve student id, name, department who are having tot_cred more than 7.5**

```
MariaDB [university]> select * from student;
+-----+---------+------------+----------+
| ID  | name    | dept_name  | tot_cred |
+-----+---------+------------+----------+
| 100 | priya   | Mtech DS   |       30 |
| 101 | hari    | Mtech COM  |       28 |
| 102 | ram     | Mtech Geo  |       26 |
| 103 | revant  | Mtech DS   |       30 |
| 104 | rishi   | Mtech COM  |       28 |
| 105 | roshan  | Mtech Geo  |       26 |
| 106 | roshini | Mtech DS   |       34 |
| 107 | rohini  | Mtech SOCD |       36 |
| 108 | raj     | Mtech SOCD |       32 |
| 109 | john    | Mtech DS   |        7 |
| 110 | bob     | Mtech COM  |        7 |
| 111 | alice   | Mtech Geo  |        8 |
+-----+---------+------------+----------+
12 rows in set (0.000 sec)

MariaDB [university]> create view studentview as select ID,name,dept_name from student where tot_cred>7.5;
Query OK, 0 rows affected (0.190 sec)

MariaDB [university]> select * from studentview;
+-----+---------+------------+
| ID  | name    | dept_name  |
+-----+---------+------------+
| 100 | priya   | Mtech DS   |
| 101 | hari    | Mtech COM  |
| 102 | ram     | Mtech Geo  |
| 103 | revant  | Mtech DS   |
| 104 | rishi   | Mtech COM  |
| 105 | roshan  | Mtech Geo  |
| 106 | roshini | Mtech DS   |
| 107 | rohini  | Mtech SOCD |
| 108 | raj     | Mtech SOCD |
| 111 | alice   | Mtech Geo  |
+-----+---------+------------+
10 rows in set (0.010 sec)
```

I inserted some values into the table to show the views. I have created a studentView which displays the student Id, name, and department, Here I have used where clause in view to show who are having the total credits more then 7.5.

6. **Create a trigger that doesn't allow inserting students data having total_cred more than 10.0.**

```
end' at line 1
MariaDB [university]> delimiter //
MariaDB [university]>  create trigger alert before insert on student
    ->  for each row
    -> begin
    ->  if new.tot_cred>10.0
    -> then SIGNAL SQLSTATE '02000' SET MESSAGE_TEXT = 'Warning: tot_cred cannot be greater than 10.0';
    -> end if
    -> ;
    -> end;
    -> //
Query OK, 0 rows affected (0.185 sec)

MariaDB [university]> insert into student values(113,"sai","Mtech DS",12);
    -> //
ERROR 1643 (02000): Warning: tot_cred cannot be greater than 10.0
MariaDB [university]>
```

Here I have created a trigger with create trigger command whenever we insert total_cred value more than 10.0 it will not allow and show a message “tot_cred cannot be greater than 10.0”

7. **Create a procedure that deletes all students who are having total_cred less than 5.0 in Mtech DS.**

```
MariaDB [university]> select * from student;
    -> //
+-----+---------+------------+----------+
| ID  | name    | dept_name  | tot_cred |
+-----+---------+------------+----------+
| 100 | priya   | Mtech DS   |       30 |
| 101 | hari    | Mtech COM  |       28 |
| 102 | ram     | Mtech Geo  |       26 |
| 103 | revant  | Mtech DS   |       30 |
| 104 | rishi   | Mtech COM  |       28 |
| 105 | roshan  | Mtech Geo  |       26 |
| 106 | roshini | Mtech DS   |       34 |
| 107 | rohini  | Mtech SOCD |       36 |
| 108 | raj     | Mtech SOCD |       32 |
| 109 | john    | Mtech DS   |        7 |
| 110 | bob     | Mtech COM  |        7 |
| 111 | alice   | Mtech Geo  |        8 |
| 115 | anju    | Mtech DS   |        4 |
| 116 | rani    | Mtech DS   |        5 |
+-----+---------+------------+----------+
14 rows in set (0.000 sec)

MariaDB [university]> create procedure student_removal()
    -> begin
    -> delete from student where tot_cred<5.0 and dept_name="Mtech DS";
    -> end;
    -> //
Query OK, 0 rows affected (0.204 sec)
```

Inserting additional values to the table, so the procedure can be observed. I Created a procedure to delete student records which have less then 5.0 credits in Mtech DS Department with above procedure

```
MariaDB [university]> call student_removal()
    -> //
Query OK, 1 row affected (0.082 sec)

MariaDB [university]> select * from student;
    -> //
+-----+---------+------------+----------+
| ID  | name    | dept_name  | tot_cred |
+-----+---------+------------+----------+
| 100 | priya   | Mtech DS   |       30 |
| 101 | hari    | Mtech COM  |       28 |
| 102 | ram     | Mtech Geo  |       26 |
| 103 | revant  | Mtech DS   |       30 |
| 104 | rishi   | Mtech COM  |       28 |
| 105 | roshan  | Mtech Geo  |       26 |
| 106 | roshini | Mtech DS   |       34 |
| 107 | rohini  | Mtech SOCD |       36 |
| 108 | raj     | Mtech SOCD |       32 |
| 109 | john    | Mtech DS   |        7 |
| 110 | bob     | Mtech COM  |        7 |
| 111 | alice   | Mtech Geo  |        8 |
| 116 | rani    | Mtech DS   |        5 |
+-----+---------+------------+----------+
13 rows in set (0.000 sec)
```

Calling the student_removel procedure, we can see that record with 4 credits has been deleted

8. **Show the details of the departments which have budgets more than the average budget across all departments. First show it without defining any function, then show it by defining a function avg_budget that returns the average budget across all departments.**

```
MariaDB [university]> select * from department where budget>(select avg(budget) from department);
    -> //
+------------+----------+-----------+
| dept_name  | building | budget    |
+------------+----------+-----------+
| Mtech Geo  | cde      | 175000.00 |
| Mtech SOCD | def      | 200000.00 |
+------------+----------+-----------+
2 rows in set (0.053 sec)

MariaDB [university]>
```

first, I find the average budget using a nested query and returned the average, then we compare it to get records that are more than the average budget using where clause

```
MariaDB [university]> create function avg_budget() returns int return (select avg(budget) from department);
    -> //
Query OK, 0 rows affected (0.191 sec)

MariaDB [university]> select avg_budget();
    -> //
+--------------+
| avg_budget() |
+--------------+
|       156250 |
+--------------+
1 row in set (0.002 sec)
```

Created a function that will return the average budget across all departments using the create function command and the sql query for average budget