# DBMS LAB CYCLE-1

## I.   *DDL Commands:*

1.  Create the database named CYBERCOLLEGE and the above tables in the CYBERCOLLEGE database; include the Primary Key Constraint, Referential Integrity Constraints, and Check Constraints.

```
mysql> use cybercollege;
Database changed
mysql> CREATE TABLE Student(Stud_no CHAR(9) PRIMARY KEY,Stud_lname CHAR(20),Stud_fname CHAR(20),Stud_address char(50),St
ud_city char(30),Stud_state Char(2),Stud_post char(9));
Query OK, 0 rows affected (0.13 sec)
```

```
mysql> desc student;
+--------------+----------+------+-----+---------+-------+
| Field        | Type     | Null | Key | Default | Extra |
+--------------+----------+------+-----+---------+-------+
| Stud_no      | char(9)  | NO   | PRI | NULL    |       |
| Stud_lname   | char(20) | YES  |     | NULL    |       |
| Stud_fname   | char(20) | YES  |     | NULL    |       |
| Stud_address | char(50) | YES  |     | NULL    |       |
| Stud_city    | char(30) | YES  |     | NULL    |       |
| Stud_state   | char(2)  | YES  |     | NULL    |       |
| Stud_post    | char(9)  | YES  |     | NULL    |       |
+--------------+----------+------+-----+---------+-------+
7 rows in set (0.08 sec)
```

```
mysql> CREATE TABLE Instructor(Inst_id char(5) PRIMARY KEY,Inst_lname char(20),Inst_fname char(20),Inst_ph char(10));
Query OK, 0 rows affected (0.06 sec)

mysql> desc Instructor;
+------------+----------+------+-----+---------+-------+
| Field      | Type     | Null | Key | Default | Extra |
+------------+----------+------+-----+---------+-------+
| Inst_id    | char(5)  | NO   | PRI | NULL    |       |
| Inst_lname | char(20) | YES  |     | NULL    |       |
| Inst_fname | char(20) | YES  |     | NULL    |       |
| Inst_ph    | char(10) | YES  |     | NULL    |       |
+------------+----------+------+-----+---------+-------+
4 rows in set (0.02 sec)
```

```
mysql> CREATE TABLE Section(Sec_id char(7) PRIMARY KEY,Time_off char(10),Days_off char(10),Sec_room char(8),Class_size numeric(3,0) CHECK(Class_size>=0),Num_enrolled numeri
c(3,0) CHECK(Num_enrolled>=0),Inst_id char(5) REFERENCES Instructor(Inst_id),Course_code char(6) REFERENCES Course(Course_code));
Query OK, 0 rows affected (0.04 sec)

mysql> desc Section;
+--------------+------------+------+-----+---------+-------+
| Field        | Type       | Null | Key | Default | Extra |
+--------------+------------+------+-----+---------+-------+
| Sec_id       | char(7)    | NO   | PRI | NULL    |       |
| Time_off     | char(10)   | YES  |     | NULL    |       |
| Days_off     | char(10)   | YES  |     | NULL    |       |
| Sec_room     | char(8)    | YES  |     | NULL    |       |
| Class_size   | decimal(3,0)| YES |     | NULL    |       |
| Num_enrolled | decimal(3,0)| YES |     | NULL    |       |
| Inst_id      | char(5)    | YES  |     | NULL    |       |
| Course_code  | char(6)    | YES  |     | NULL    |       |
+--------------+------------+------+-----+---------+-------+
8 rows in set (0.04 sec)
```

```
mysql> CREATE TABLE Course(Course_code char(6) PRIMARY KEY,Course_title char(25),Course_hour Numeric(2,0),Semester char(20));
Query OK, 0 rows affected (0.05 sec)

mysql> desc Course;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| Course_code | char(6)     | NO   | PRI | NULL    |       |
| Course_title| char(25)    | YES  |     | NULL    |       |
| Course_hour | decimal(2,0)| YES  |     | NULL    |       |
| Semester    | char(20)    | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.03 sec)
```

2. Add a field **Country** to the **Student** table with the default value set to 'India'.

```
mysql> alter table student add country char(20) default 'india';
Query OK, 0 rows affected (1.41 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc student;
+------------+----------+------+-----+---------+-------+
| Field      | Type     | Null | Key | Default | Extra |
+------------+----------+------+-----+---------+-------+
| Stud_no    | char(9)  | NO   | PRI | NULL    |       |
| Stud_name  | char(30) | YES  |     | NULL    |       |
| Stud_fname | char(20) | YES  |     | NULL    |       |
| Address    | char(30) | YES  |     | NULL    |       |
| city       | char(20) | YES  |     | NULL    |       |
| state      | char(20) | YES  |     | NULL    |       |
| PostalCode | char(9)  | YES  |     | NULL    |       |
| country    | char(20) | YES  |     | india   |       |
+------------+----------+------+-----+---------+-------+
8 rows in set (0.13 sec)
```

3. Add a constraint to the **Grade** field in the **Enrollment** table that accepts only the values 'A', 'B' and 'C'

```
mysql> alter table enrollment add constraint grade check (grade='a' or grade='b' or grade='c');
Query OK, 0 rows affected (2.02 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql>
```

4. Modify the table **Enrollment** by changing the width of the field **Grade** to 2

```
mysql> alter table enrollment modify grade char(2);
Query OK, 0 rows affected (0.90 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> _
```

5. Add a new column, salary to the INSTRUCTOR table and display its modified schema.

```
mysql> desc INSTRUCTOR;
+------------------+----------+------+-----+---------+-------+
| Field            | Type     | Null | Key | Default | Extra |
+------------------+----------+------+-----+---------+-------+
| Instructor_id    | char(5)  | NO   | PRI | NULL    |       |
| Instructor_lname | char(30) | YES  |     | NULL    |       |
| Instructor_fname | char(30) | YES  |     | NULL    |       |
| Instructor_phone | char(12) | YES  |     | NULL    |       |
| Instructor_mailid| char(45) | YES  |     | NULL    |       |
+------------------+----------+------+-----+---------+-------+
5 rows in set (0.07 sec)

mysql> alter table INSTRUCTOR add Salary varchar(10);
Query OK, 0 rows affected (0.32 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc INSTRUCTOR;
+------------------+-------------+------+-----+---------+-------+
| Field            | Type        | Null | Key | Default | Extra |
+------------------+-------------+------+-----+---------+-------+
| Instructor_id    | char(5)     | NO   | PRI | NULL    |       |
| Instructor_lname | char(30)    | YES  |     | NULL    |       |
| Instructor_fname | char(30)    | YES  |     | NULL    |       |
| Instructor_phone | char(12)    | YES  |     | NULL    |       |
| Instructor_mailid| char(45)    | YES  |     | NULL    |       |
| Salary           | varchar(10) | YES  |     | NULL    |       |
+------------------+-------------+------+-----+---------+-------+
6 rows in set (0.00 sec)

mysql> _
```

6. Drop the column **Country** from the table **Student** .

```
mysql> alter table student drop country;
Query OK, 0 rows affected (1.15 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc student;
+------------+----------+------+-----+---------+-------+
| Field      | Type     | Null | Key | Default | Extra |
+------------+----------+------+-----+---------+-------+
| Stud_no    | char(9)  | NO   | PRI | NULL    |       |
| Stud_name  | char(30) | YES  |     | NULL    |       |
| Stud_fname | char(20) | YES  |     | NULL    |       |
| Address    | char(30) | YES  |     | NULL    |       |
| city       | char(20) | YES  |     | NULL    |       |
| state      | char(20) | YES  |     | NULL    |       |
| PostalCode | char(9)  | YES  |     | NULL    |       |
+------------+----------+------+-----+---------+-------+
7 rows in set (0.00 sec)

mysql>
```

7. Create a view for instructors to display the courses taught by an instructor. Display the personal details but by hiding salary information.

```
mysql> create view ins as select i.inst_id,i.inst_lname,i.inst_ph,c.course_title from instructor i join course c join section s where i.inst_id=s.inst_id and s.course_code=
c.course_code;
Query OK, 0 rows affected (0.01 sec)

mysql> select * from ins;
+---------+------------+------------+--------------+
| inst_id | inst_lname | inst_ph    | course_title |
+---------+------------+------------+--------------+
| 202     | Ashna      | 8237688843 | ADS          |
| 201     | Asha       | 8237676543 | ASE          |
+---------+------------+------------+--------------+
2 rows in set (0.00 sec)
```

## II. DML Commands:

8. Add details of you and your 5 friends in the Student table

```
mysql> insert into student values(001,'Hema','Babu','Vazhakkal','Ernakulam','Kerala',682030);
Query OK, 1 row affected (0.24 sec)

mysql> insert into student values(002,'Ardhra','PK','Edapally','Ernakulam','Kerala',682034);
Query OK, 1 row affected (0.11 sec)

mysql> insert into student values(003,'Anu','Nelson','Chalakudy','Thrissur','Kerala',682036);
Query OK, 1 row affected (0.11 sec)

mysql> insert into student values(004,'Neha','Prince','Pulpally','Wayanad','Kerala',682032);
Query OK, 1 row affected (0.11 sec)

mysql> insert into student values(005,'Melgin','Manoj','Bathery','Wayanad','Kerala',682038);
Query OK, 1 row affected (0.09 sec)

mysql> insert into student values(006,'Jen','George','Kottayam','Kottayam','Kerala',682040);
Query OK, 1 row affected (0.16 sec)

mysql> select * from student;
+---------+-----------+------------+-----------+-----------+--------+------------+
| Stud_no | Stud_name | Stud_fname | Address   | city      | state  | PostalCode |
+---------+-----------+------------+-----------+-----------+--------+------------+
| 1       | Hema      | Babu       | Vazhakkal | Ernakulam | Kerala | 682030     |
| 2       | Ardhra    | PK         | Edapally  | Ernakulam | Kerala | 682034     |
| 3       | Anu       | Nelson     | Chalakudy | Thrissur  | Kerala | 682036     |
| 4       | Neha      | Prince     | Pulpally  | Wayanad   | Kerala | 682032     |
| 5       | Melgin    | Manoj      | Bathery   | Wayanad   | Kerala | 682038     |
| 6       | Jen       | George     | Kottayam  | Kottayam  | Kerala | 682040     |
+---------+-----------+------------+-----------+-----------+--------+------------+
6 rows in set (0.02 sec)
```

9. Add details of the first and second semester courses. Also add a new course for Data Mining with a course code of 20MCA260 worth with credit of 4 hours.

```
mysql> insert into course values('20mca101','mfcs',8);
Query OK, 1 row affected (0.12 sec)

mysql> insert into course values('20mca102','digital',10);
Query OK, 1 row affected (0.12 sec)

mysql> insert into course values('20mca103','Software Engineering',7);
Query OK, 1 row affected (0.07 sec)

mysql> insert into course values('20mca104','Data Structure',12);
Query OK, 1 row affected (0.15 sec)

mysql> insert into course values('20mca105','OB',10);
Query OK, 1 row affected (0.15 sec)

mysql> insert into course values('20mca106','ADBMS',10);
Query OK, 1 row affected (0.10 sec)

mysql> insert into course values('20mca107','ACN',9);
Query OK, 1 row affected (0.16 sec)

mysql> insert into course values('20mca108','AI',8);
Query OK, 1 row affected (0.11 sec)

mysql> select * from course;
+-------------+----------------------+--------------+
| course_code | Course_Title         | Course_Hours |
+-------------+----------------------+--------------+
| 20mca101    | mfcs                 |            8 |
| 20mca102    | digital              |           10 |
| 20mca103    | Software Engineering |            7 |
| 20mca104    | Data Structure       |           12 |
| 20mca105    | OB                   |           10 |
| 20mca106    | ADBMS                |           10 |
| 20mca107    | ACN                  |            9 |
| 20mca108    | AI                   |            8 |
+-------------+----------------------+--------------+
8 rows in set (0.00 sec)
```

```
mysql> insert into course values('20mca260','Data Mining',4);
Query OK, 1 row affected (0.08 sec)

mysql> select * from course;
+-------------+----------------------+--------------+
| course_code | Course_Title         | Course_Hours |
+-------------+----------------------+--------------+
| 20mca101    | mfcs                 |            8 |
| 20mca102    | digital              |           10 |
| 20mca103    | Software Engineering |            7 |
| 20mca104    | Data Structure       |           12 |
| 20mca105    | OB                   |           10 |
| 20mca106    | ADBMS                |           10 |
| 20mca107    | ACN                  |            9 |
| 20mca108    | AI                   |            8 |
| 20mca260    | Data Mining          |            4 |
+-------------+----------------------+--------------+
9 rows in set (0.04 sec)
```

10. Add a new section for this new course with section ID as 3011.The section should meet in 2-4 on MW in BLGNG102. The class size should be 35, and number enrolled should be 0. The instructor should be 3, and the course is 20MCA260. Also add sections 302 and 303 for the courses AOS and OB and enrol 5 students each to these courses.

```
mysql> select * from section;
+------------+--------------+-------------+--------------+------------+-----------------+---------------+-------------+
| Section_id | Time_Offered | Days_Offered | Section_Room | Class_Size | Number_Enrolled | Instructor_id | course_code |
+------------+--------------+-------------+--------------+------------+-----------------+---------------+-------------+
| 301        | -2           | MW          | BLGNG102     | 39         | 0               | 11113         | 20mca260    |
| 302        | 5            | MW          | BLGNG103     | 45         | 5               | 11114         | 20MCA105    |
| 303        | 9            | MW          | BLGNG104     | 40         | 5               | 11115         | 20MCA110    |
+------------+--------------+-------------+--------------+------------+-----------------+---------------+-------------+
3 rows in set (0.13 sec)

mysql> update section set Time_Offered = 2.4 where section_id = 301;
Query OK, 1 row affected (0.32 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from section;
+------------+--------------+-------------+--------------+------------+-----------------+---------------+-------------+
| Section_id | Time_Offered | Days_Offered | Section_Room | Class_Size | Number_Enrolled | Instructor_id | course_code |
+------------+--------------+-------------+--------------+------------+-----------------+---------------+-------------+
| 301        | 2.4          | MW          | BLGNG102     | 39         | 0               | 11113         | 20mca260    |
| 302        | 5            | MW          | BLGNG103     | 45         | 5               | 11114         | 20MCA105    |
| 303        | 9            | MW          | BLGNG104     | 40         | 5               | 11115         | 20MCA110    |
+------------+--------------+-------------+--------------+------------+-----------------+---------------+-------------+
3 rows in set (0.00 sec)

mysql>
```

11. Register yourself along with your 3 friends for this new course by adding a row to the ENROLLMENT table. The grade should be null.

```
mysql> insert into enrollment values(001,301,'');
Query OK, 1 row affected (0.08 sec)

mysql> insert into enrollment values(004,303,'');
Query OK, 1 row affected (0.10 sec)

mysql> insert into enrollment values(003,302,'');
Query OK, 1 row affected (0.08 sec)

mysql> select * from enrollment;
+---------+------------+-------+
| Stud_no | Section_id | grade |
+---------+------------+-------+
| 2       | 302        |       |
| 5       | 301        |       |
| 1       | 301        |       |
| 4       | 303        |       |
| 3       | 302        |       |
+---------+------------+-------+
5 rows in set (0.00 sec)

mysql>
```

12. Update the 301 section, and increase the class sizes by 10%.

```
mysql> update section set class_size=class_size+(class_size * 10/100)where section_id=301;
Query OK, 1 row affected, 1 warning (0.15 sec)
Rows matched: 1  Changed: 1  Warnings: 1

mysql> select * from section;
+------------+-------------+--------------+--------------+------------+-----------------+---------------+-------------+
| Section_id | Time_Offered | Days_Offered | Section_Room | Class_Size | Number_Enrolled | Instructor_id | course_code |
+------------+-------------+--------------+--------------+------------+-----------------+---------------+-------------+
| 301        | -2          | MW           | BLGNG102     | 39         | 0               | 11113         | 20mca260    |
| 302        | 5           | MW           | BLGNG103     | 45         | 5               | 11114         | 20MCA105    |
| 303        | 9           | MW           | BLGNG104     | 40         | 5               | 11115         | 20MCA110    |
+------------+-------------+--------------+--------------+------------+-----------------+---------------+-------------+
3 rows in set (0.00 sec)
```

13. Give a 10% increment in salary for all instructors.

```
mysql> select * from instructor;
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | Instructor_mailid | Salary |
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
| 1             | Asha            | Boby            | 8765549876      | asha@gmail.com    | 20000  |
| 2             | Ashna           | Antony          | 9876543210      | ashna@gmail.com   | 450000 |
| 3             | Sandeep         | Manoj           | 9876513256      | sandeep@gmail.com | 50000  |
| 4             | asifa           | Sabu            | 87643125678     | asifa@gmail.com   | 850000 |
| 5             | George          | Binod           | 8654826478      | george@gmail.com  | 80000  |
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
5 rows in set (0.00 sec)

mysql> update instructor set salary = salary+(salary*10/100);
Query OK, 5 rows affected (0.08 sec)
Rows matched: 5  Changed: 5  Warnings: 0

mysql> select * from instructor;
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | Instructor_mailid | Salary |
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
| 1             | Asha            | Boby            | 8765549876      | asha@gmail.com    | 22000  |
| 2             | Ashna           | Antony          | 9876543210      | ashna@gmail.com   | 495000 |
| 3             | Sandeep         | Manoj           | 9876513256      | sandeep@gmail.com | 55000  |
| 4             | asifa           | Sabu            | 87643125678     | asifa@gmail.com   | 935000 |
| 5             | George          | Binod           | 8654826478      | george@gmail.com  | 88000  |
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
5 rows in set (0.00 sec)

mysql>
```

14. Delete Section 302and verify for the rows in ENROLMENT table for that section.

```
mysql> DELETE FROM SECTION WHERE SECTION_ID=302;
Query OK, 1 row affected (0.11 sec)

mysql> SELECT * FROM SECTION;
+------------+-------------+-------------+--------------+------------+-----------------+---------------+-------------+
| Section_id | Time_Offered | Days_Offered | Section_Room | Class_Size | Number_Enrolled | Instructor_id | course_code |
+------------+-------------+-------------+--------------+------------+-----------------+---------------+-------------+
| 301        | 2.4         | MW          | BLGNG102     | 39         | 0               | 11113         | 20mca260    |
| 303        | 9           | MW          | BLGNG104     | 40         | 5               | 11115         | 20MCA110    |
+------------+-------------+-------------+--------------+------------+-----------------+---------------+-------------+
2 rows in set (0.03 sec)

mysql>
```

# III. TCL Commands:

15. Undo the previous delete operation.

```
mysql> ROLLBACK;
Query OK, 0 rows affected (0.00 sec)

mysql>
```

16. Save all the transactions to the database.

```
mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql>
```

17. Grant the privilege to read and delete from the ENROLMENT table to the User U1.

```
mysql> SELECT USER FROM mysql.user;
+------------------+
| USER             |
+------------------+
| U1               |
| mysql.infoschema |
| mysql.session    |
| mysql.sys        |
| root             |
+------------------+
5 rows in set (0.00 sec)

mysql> GRANT SELECT,UPDATE ON ENROLLMENT TO U1;
Query OK, 0 rows affected (0.19 sec)

mysql> SHOW GRANTS FOR 'U1';
+--------------------------------------------------------------------+
| Grants for U1@%                                                    |
+--------------------------------------------------------------------+
| GRANT USAGE ON *.* TO `U1`@`%`                                     |
| GRANT SELECT, UPDATE ON `cybercollege`.`enrollment` TO `U1`@`%`    |
+--------------------------------------------------------------------+
2 rows in set (0.04 sec)

mysql>
```

18. Revoke the delete privilege from U1.

```
mysql> REVOKE delete ON Enrollment FROM U1;
Query OK, 0 rows affected (0.11 sec)

mysql> SHOW GRANTS FOR 'U1';
+-------------------------------------------------------------------+
| Grants for U1@%                                                   |
+-------------------------------------------------------------------+
| GRANT USAGE ON *.* TO `U1`@`%`                                    |
| GRANT SELECT, UPDATE ON `cybercollege`.`enrollment` TO `U1`@`%`   |
+-------------------------------------------------------------------+
2 rows in set (0.00 sec)

mysql>
```

## IV. Accessing database (SELECT, Filtering using WHERE, HAVING, GROUP BY, ORDER BY Clauses, Subquery):

19. Display the full name and contact details of students living in Kochi.

```
mysql> select * from student;
+---------+-----------+------------+-----------+----------+---------+------------+
| Stud_no | Stud_name | Stud_fname | Address   | city     | state   | PostalCode |
+---------+-----------+------------+-----------+----------+---------+------------+
| 1       | Hema      | Babu       | Vazhakkal | Kochi    | Kerala  | 682030     |
| 2       | Ardhra    | PK         | Edapally  | Kochi    | Kerala  | 682034     |
| 3       | Anu       | Nelson     | Chalakudy | Thrissur | Kerala  | 682036     |
| 4       | Neha      | Prince     | Pulpally  | Wayanad  | Kerala  | 682032     |
| 5       | Melgin    | Manoj      | Bathery   | Wayanad  | Kerala  | 682038     |
| 6       | Jen       | George     | Kottayam  | Kottayam | Kerala  | 682040     |
+---------+-----------+------------+-----------+----------+---------+------------+
6 rows in set (0.00 sec)

mysql> select stud_name,stud_fname,address from student where city='kochi';
+-----------+------------+-----------+
| stud_name | stud_fname | address   |
+-----------+------------+-----------+
| Hema      | Babu       | Vazhakkal |
| Ardhra    | PK         | Edapally  |
+-----------+------------+-----------+
2 rows in set (0.00 sec)
```

20. List the student details who has longest first name.

```
mysql> select * from student;
+---------+-----------+-----------+-----------+----------+--------+------------+
| Stud_no | Stud_name | Stud_fname | Address   | city     | state  | PostalCode |
+---------+-----------+-----------+-----------+----------+--------+------------+
| 1       | Hema      | Babu      | Vazhakkal | Kochi    | Kerala | 682030     |
| 2       | Ardhra    | PK        | Edapally  | Kochi    | Kerala | 682034     |
| 3       | Anu       | Nelson    | Chalakudy | Thrissur | Kerala | 682036     |
| 4       | Neha      | Prince    | Pulpally  | Wayanad  | Kerala | 682032     |
| 5       | Melgin    | Manoj     | Bathery   | Wayanad  | Kerala | 682038     |
| 6       | Jen       | George    | Kottayam  | Kottayam | Kerala | 682040     |
+---------+-----------+-----------+-----------+----------+--------+------------+
6 rows in set (0.00 sec)

mysql> select * from student where length(stud_fname)=(select max(length(stud_fname))from student);
+---------+-----------+-----------+-----------+----------+--------+------------+
| Stud_no | Stud_name | Stud_fname | Address   | city     | state  | PostalCode |
+---------+-----------+-----------+-----------+----------+--------+------------+
| 3       | Anu       | Nelson    | Chalakudy | Thrissur | Kerala | 682036     |
| 4       | Neha      | Prince    | Pulpally  | Wayanad  | Kerala | 682032     |
| 6       | Jen       | George    | Kottayam  | Kottayam | Kerala | 682040     |
+---------+-----------+-----------+-----------+----------+--------+------------+
3 rows in set (0.00 sec)
```

21. Display the name and phone number of the instructors who is handling the courses AOS and ADBMS.

```
mysql> select inst_lname,inst_ph from instructor i join course c join section s where i.inst_id=s.inst_id and s.course_code= c.course_code and  c.course_title ='ADS'or'DBMS
';
+-----------+------------+
| inst_lname | inst_ph   |
+-----------+------------+
| Ashna     | 8237688843 |
+-----------+------------+
1 row in set, 1 warning (0.00 sec)
```

22. List the codes, titles, and credit hours for courses worth 4 hours. Order the results in descending order of course code.

```
mysql> SELECT COURSE_CODE,COURSE_TITLE,COURSE_HOURS FROM COURSE WHERE COURSE_HOURS=4 ORDER BY COURSE_CODE DESC;
+-------------+--------------+--------------+
| COURSE_CODE | COURSE_TITLE | COURSE_HOURS |
+-------------+--------------+--------------+
| 20mca260    | Data Mining  |            4 |
+-------------+--------------+--------------+
1 row in set (0.05 sec)

mysql>
```

23. Display the names of the students in the descending order along with their phone number.

```
mysql> SELECT * FROM STUDENT;
+---------+-----------+-----------+-----------+----------+--------+------------+---------+
| Stud_no | Stud_name | Stud_fname| Address   | city     | state  | PostalCode | country |
+---------+-----------+-----------+-----------+----------+--------+------------+---------+
| 1       | Hema      | Babu      | Vazhakkal | Kochi    | Kerala | 682030     | India   |
| 2       | Ardhra    | PK        | Edapally  | Kochi    | Kerala | 682034     | India   |
| 3       | Anu       | Nelson    | Chalakudy | Thrissur | Kerala | 682036     | India   |
| 4       | Neha      | Prince    | Pulpally  | Wayanad  | Kerala | 682032     | India   |
| 5       | Melgin    | Manoj     | Bathery   | Wayanad  | Kerala | 682038     | India   |
| 6       | Jen       | George    | Kottayam  | Kottayam | Kerala | 682040     | India   |
+---------+-----------+-----------+-----------+----------+--------+------------+---------+
6 rows in set (0.06 sec)

mysql> SELECT STUD_NAME,STUD_FNAME FROM STUDENT ORDER BY STUD_FNAME DESC;
+-----------+------------+
| STUD_NAME | STUD_FNAME |
+-----------+------------+
| Neha      | Prince     |
| Ardhra    | PK         |
| Anu       | Nelson     |
| Melgin    | Manoj      |
| Jen       | George     |
| Hema      | Babu       |
+-----------+------------+
6 rows in set (0.00 sec)

mysql>
```

24. List the student's name, course code and section id grouping the students by their grade.



# V. Optimizing databases (Join, Aggregate & Set operations, Other operators like arithmetic, logical, special etc):

25. Use an inner join between the STUDENT and ENROLMENT tables for showing the full name, Section id and Grade.

```
mysql> SELECT STUDENT.STUD_NAME,STUDENT.STUD_FNAME,ENROLLMENT.SECTION_ID,ENROLLMENT.GRADE FROM STUDENT INNER JOIN ENROLLMENT ON STUDENT.STUD_NO=ENROLLMENT.STUD_NO;
+-----------+------------+------------+-------+
| STUD_NAME | STUD_FNAME | SECTION_ID | GRADE |
+-----------+------------+------------+-------+
| Ardhra    | PK         | 302        |       |
| Melgin    | Manoj      | 301        |       |
| Hema      | Babu       | 301        |       |
| Neha      | Prince     | 303        |       |
| Anu       | Nelson     | 302        |       |
+-----------+------------+------------+-------+
5 rows in set (0.12 sec)

mysql>
```

26. Use an outer join between the STUDENT and ENROLMENT tables for showing the full name, Section id and Grade. Include all the students regardless of whether they have a matching section.

```
mysql> select student.stud_name,student.stud_fname,enrollment.section_id,enrollment.grade from student left join enrollment on student.stud_no=enrollment.stud_no;
+-----------+------------+------------+-------+
| stud_name | stud_fname | section_id | grade |
+-----------+------------+------------+-------+
| Hema      | Babu       | 301        |       |
| Ardhra    | PK         | 302        |       |
| Anu       | Nelson     | 302        |       |
| Neha      | Prince     | 303        |       |
| Melgin    | Manoj      | 301        |       |
| Jen       | George     | NULL       | NULL  |
+-----------+------------+------------+-------+
6 rows in set (0.01 sec)

mysql>
```

27. Give a 7% salary raise to instructors whose salary is less than the average.

```
mysql> UPDATE INSTRUCTOR SET SALARY = SALARY+(SALARY *7/100) WHERE SALARY<(SELECT AVG(SALARY));
Query OK, 0 rows affected (0.08 sec)
Rows matched: 0  Changed: 0  Warnings: 0

mysql> SELECT * FROM INSTRUCTOR;
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | Instructor_mailid | Salary |
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
| 1             | Asha            | Boby            | 8765549876      | asha@gmail.com    | 22000  |
| 2             | Ashna           | Antony          | 9876543210      | ashna@gmail.com   | 495000 |
| 3             | Sandeep         | Manoj           | 9876513256      | sandeep@gmail.com | 55000  |
| 4             | asifa           | Sabu            | 87643125678     | asifa@gmail.com   | 935000 |
| 5             | George          | Binod           | 8654826478      | george@gmail.com  | 88000  |
+---------------+-----------------+-----------------+-----------------+-------------------+--------+
5 rows in set (0.00 sec)

mysql>
```

28. List full name and salary of instructors whose last name ends with 'a' and earns highest salary.

```
mysql> select * from instructor;
+---------------+----------------+----------------+------------------+------------------+--------+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | Instructor_mailid | Salary |
+---------------+----------------+----------------+------------------+------------------+--------+
| 1             | Asha           | Boby           | 8765549876       | asha@gmail.com    | 22000  |
| 2             | Ashna          | Antony         | 9876543210       | ashna@gmail.com   | 495000 |
| 3             | Sandeep        | Manoj          | 9876513256       | sandeep@gmail.com | 55000  |
| 4             | asifa          | Sabu           | 87643125678      | asifa@gmail.com   | 935000 |
| 5             | George         | Binod          | 8654826478       | george@gmail.com  | 88000  |
+---------------+----------------+----------------+------------------+------------------+--------+
5 rows in set (0.00 sec)

mysql> select instructor_lname,salary from instructor where salary = (select max(salary) from instructor)and instructor_lname in(select instructor_lname from instructor where instructor_lname like '%a');
+------------------+--------+
| instructor_lname | salary |
+------------------+--------+
| asifa            | 935000 |
+------------------+--------+
1 row in set (0.00 sec)

mysql>
```

## 29. Display the details of instructor who draws lowest salary.

```
mysql> select * from instructor;
+---------------+------------------+------------------+------------------+-------------------+--------+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | Instructor_mailid | Salary |
+---------------+------------------+------------------+------------------+-------------------+--------+
| 1             | Asha             | Boby             | 8765549876       | asha@gmail.com    | 22000  |
| 2             | Ashna            | Antony           | 9876543210       | ashna@gmail.com   | 495000 |
| 3             | Sandeep          | Manoj            | 9876513256       | sandeep@gmail.com | 55000  |
| 4             | asifa            | Sabu             | 87643125678      | asifa@gmail.com   | 935000 |
| 5             | George           | Binod            | 8654826478       | george@gmail.com  | 88000  |
+---------------+------------------+------------------+------------------+-------------------+--------+
5 rows in set (0.00 sec)

mysql> select * from instructor where salary=(select min(salary)from instructor);
+---------------+------------------+------------------+------------------+-------------------+--------+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | Instructor_mailid | Salary |
+---------------+------------------+------------------+------------------+-------------------+--------+
| 1             | Asha             | Boby             | 8765549876       | asha@gmail.com    | 22000  |
+---------------+------------------+------------------+------------------+-------------------+--------+
1 row in set (0.00 sec)

mysql>
```

## 30. List the students details who lived in Kochi, Kerala or in Bangalore, Karnataka or both.

```
mysql> select * from student;
+--------+-----------+------------+-----------+----------+--------+------------+---------+
| Stud_no | Stud_name | Stud_fname | Address   | city     | state  | PostalCode | country |
+--------+-----------+------------+-----------+----------+--------+------------+---------+
| 1       | Hema      | Babu       | Vazhakkal | Kochi    | Kerala | 682030     | India   |
| 2       | Ardhra    | PK         | Edapally  | Kochi    | Kerala | 682034     | India   |
| 3       | Anu       | Nelson     | Chalakudy | Thrissur | Kerala | 682036     | India   |
| 4       | Neha      | Prince     | Pulpally  | Wayanad  | Kerala | 682032     | India   |
| 5       | Melgin    | Manoj      | Bathery   | Wayanad  | Kerala | 682038     | India   |
| 6       | Jen       | George     | Kottayam  | Kottayam | Kerala | 682040     | India   |
+--------+-----------+------------+-----------+----------+--------+------------+---------+
6 rows in set (0.00 sec)

mysql> select * from student where city= 'kochi'  and 'kerala' or 'bangalore'and 'karnataka'  or city in('kochi','kerala','bangalore','karnataka');
+--------+-----------+------------+-----------+-------+--------+------------+---------+
| Stud_no | Stud_name | Stud_fname | Address   | city  | state  | PostalCode | country |
+--------+-----------+------------+-----------+-------+--------+------------+---------+
| 1       | Hema      | Babu       | Vazhakkal | Kochi | Kerala | 682030     | India   |
| 2       | Ardhra    | PK         | Edapally  | Kochi | Kerala | 682034     | India   |
+--------+-----------+------------+-----------+-------+--------+------------+---------+
2 rows in set, 2 warnings (0.04 sec)

mysql>
```