

# ADBMS FIRST LAB CYCLE

Q1. Design and built a simple relational database system and demonstrate competence with the fundamental tasks involved with modelling, designing and implementing a database.

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.

## TABLE Student

```
mysql> CREATE TABLE Student (Stud_no varchar(9) primary key, Stud_lname varchar(30), Stud_fname varchar(20), Stud_address
varchar(50), Stud_City varchar(30), State varchar(2), PostalCode varchar(9));
Query OK, 0 rows affected (1.09 sec)

mysql> DESC Student;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Stud_no | varchar(9) | NO | PRI | NULL | |
| Stud_lname | varchar(30) | YES | | NULL | |
| Stud_fname | varchar(20) | YES | | NULL | |
| Stud_address | varchar(50) | YES | | NULL | |
| Stud_City | varchar(30) | YES | | NULL | |
| State | varchar(2) | YES | | NULL | |
| PostalCode | varchar(9) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.10 sec)
```

## TABLE Instructor

```
mysql> CREATE TABLE Instructor (Instructor_id varchar(5) PRIMARY KEY, Instructor_lname varchar(30),
-> Instructor_fname varchar(20), Instructor_phone varchar(8));
Query OK, 0 rows affected (1.16 sec)

mysql> DESC Instructor;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Instructor_id | varchar(5) | NO | PRI | NULL | |
| Instructor_lname | varchar(30) | YES | | NULL | |
| Instructor_fname | varchar(20) | YES | | NULL | |
| Instructor_phone | varchar(8) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.10 sec)

mysql>
```

## TABLE course

```
mysql> CREATE TABLE Course( Course_Code varchar(6) PRIMARY KEY, Course_Title varchar(25), Course_Hours NUMERIC(2,0),
Semester varchar(20));
Query OK, 0 rows affected (0.62 sec)

mysql> DESC Course;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Course_Code | varchar(6) | NO | PRI | NULL | |
| Course_Title | varchar(25) | YES | | NULL | |
| Course_Hours | decimal(2,0) | YES | | NULL | |
| Semester | varchar(20) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.13 sec)

mysql>
```

## TABLE SECTION

```
mysql> CREATE TABLE Section( Section_id Numeric PRIMARY KEY, Time_offered varchar(10),
-> Day_offered varchar(10), Section_room varchar(8), Class_size Numeric(3,0) CHECK(Class_size>=0),
-> Number_enrolled numeric(3,0) CHECK(Number_enrolled>=0), Instructor_id varchar(5) REFERENCES
-> Instructor (Instructor_id), Course_code varchar(6) REFERENCES Course(Course_code));
Query OK, 0 rows affected (0.86 sec)

mysql> DESC Section;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Section_id     | decimal(10,0) | NO   | PRI | NULL    |       |
| Time_offered   | varchar(10)    | YES  |     | NULL    |       |
| Day_offered    | varchar(10)    | YES  |     | NULL    |       |
| Section_room   | varchar(8)     | YES  |     | NULL    |       |
| Class_size     | decimal(3,0)   | YES  |     | NULL    |       |
| Number_enrolled | decimal(3,0)   | YES  |     | NULL    |       |
| Instructor_id  | varchar(5)     | YES  |     | NULL    |       |
| Course_code    | varchar(6)     | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
8 rows in set (0.22 sec)

mysql> _
```

## TABLE enrolment

```
mysql> CREATE TABLE Enrolment(Stud_no varchar(9) NOT NULL REFERENCES Student(Stud_no), Section_id varchar
-> (7) NOT NULL REFERENCES Section(Section_id), Grade varchar(2), PRIMARY key(Stud_no,Section_id));
Query OK, 0 rows affected (0.24 sec)

mysql> DESC Enrolment;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Stud_no       | varchar(9)    | NO   | PRI | NULL    |       |
| Section_id    | varchar(7)    | NO   | PRI | NULL    |       |
| Grade         | varchar(2)    | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.25 sec)

mysql> _
```

2. Add a field Country to the STUDENT table with the default values set to “India”.

```
mysql> alter TABLE Student ADD Country varchar(20) DEFAULT 'India';
Query OK, 0 rows affected (0.63 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> DESC Student;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Stud_no       | varchar(9)    | NO   | PRI | NULL    |       |
| Stud_lname    | varchar(30)   | YES  |     | NULL    |       |
| Stud_fname    | varchar(20)   | YES  |     | NULL    |       |
| Stud_address  | varchar(50)   | YES  |     | NULL    |       |
| Stud_City     | varchar(30)   | YES  |     | NULL    |       |
| State         | varchar(2)    | YES  |     | NULL    |       |
| PostalCode    | varchar(9)    | YES  |     | NULL    |       |
| Country       | varchar(20)   | YES  |     | India   |       |
+-----+-----+-----+-----+-----+-----+
8 rows in set (0.10 sec)

mysql> _
```

3. Add a constraint to the Grade field in the ENROLMENT table that accepts only the values A,B,C,

```
mysql> ALTER TABLE enrolment ADD CONSTRAINT grade CHECK (grade IN ('A', 'B', 'C'));
Query OK, 0 rows affected (0.12 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql>
```

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

```
mysql> use cyber_college;
Database changed
mysql> alter table ENROLMENT modify grade varchar(2);
Query OK, 0 rows affected (3.26 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

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

```
-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
-----+-----+-----+-----+-----+-----+
| Instructor_id | varchar(5) | NO | PRI | NULL | |
| Instructor_lname | varchar(30) | YES | | NULL | |
| Instructor_fname | varchar(20) | YES | | NULL | |
| Instructor_phone | varchar(8) | YES | | NULL | |
| salary | varchar(10) | YES | | NULL | |
-----+-----+-----+-----+-----+-----+
5 rows in set (0.38 sec)
```

6. Drop the column Country from the STUDENT table.

Command Prompt - mysql -u root -p

```
mysql> alter table STUDENT drop country;
Query OK, 0 rows affected (1.50 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> desc STUDENT;
```

Field	Type	Null	Key	Default	Extra
Stud_No	varchar(9)	NO	PRI	NULL	
Stud_lname	varchar(30)	YES		NULL	
Stud_fname	varchar(20)	YES		NULL	
Stud_address	varchar(50)	YES		NULL	
Stud_City	varchar(30)	YES		NULL	
State	varchar(2)	YES		NULL	
PostalCode	varchar(9)	YES		NULL	

7 rows in set (0.14 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 INST AS SELECT i.instructor_id,i.instructor_lname,i.instructor_phone,c.course_code,c.course_title,c.course_hours FROM instructor i,course c ;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> DESC INST;
```

Field	Type	Null	Key	Default	Extra
instructor_id	varchar(9)	NO		NULL	
instructor_lname	varchar(30)	YES		NULL	
instructor_phone	varchar(15)	YES		NULL	
course_code	varchar(10)	NO		NULL	
course_title	varchar(25)	YES		NULL	
course_hours	decimal(2,0)	YES		NULL	

6 rows in set (0.02 sec)

8. Insert details of you and your friends in STUDENT table and the details of instructors with names (Asha, Ashna Sandeep, Asia, George) in INSTRUCTOR table.

```

MySQL 5.5 Command Line Client
mysql> insert into instructor values(201,'Asha','k',98968564);
ERROR 1136 (21501): Column count doesn't match value count at row 1
mysql> desc instructor;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| inst_id | varchar(5) | NO | PRI | NULL | |
| inst_fname | varchar(20) | YES | | NULL | |
| inst_lname | varchar(30) | YES | | NULL | |
| inst_phone | varchar(8) | YES | | NULL | |
| salary | varchar(10) | YES | | NULL | |
+-----+-----+-----+-----+-----+
5 rows in set (0.05 sec)

mysql> insert into instructor values(201,'Asha',' ',98968564,20000);
Query OK, 1 row affected (0.07 sec)

mysql> insert into instructor values(202,'Ashna',' ',9895236,20500);
Query OK, 1 row affected (0.04 sec)

mysql> insert into instructor values(203,'Sandeep',' ',9965321,30000);
Query OK, 1 row affected (0.01 sec)

mysql> insert into instructor values(204,'Asifa',' ',9526431,40000);
Query OK, 1 row affected (0.05 sec)

mysql> insert into instructor values(205,'George',' ',9512431,1000);
Query OK, 1 row affected (0.01 sec)

mysql> select* from instructor;
+-----+-----+-----+-----+-----+
| inst_id | inst_fname | inst_lname | inst_phone | salary |
+-----+-----+-----+-----+-----+
| 201 | Asha | | 98968564 | 20000 |
| 202 | Ashna | | 9895236 | 20500 |
| 203 | Sandeep | | 9965321 | 30000 |
| 204 | Asifa | | 9526431 | 40000 |
| 205 | George | | 9512431 | 1000 |
+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql>

```

```

Command Prompt - mysql -u root -p

mysql> insert into STUDENT values(101,'Asha','Thomas','Areekkal','Thrissur','k','682017');
Query OK, 1 row affected (0.23 sec)

mysql> insert into STUDENT values(102,'Nimisha','NM','Azhimugam','Ernakulam','k','682036');
Query OK, 1 row affected (0.08 sec)

mysql> insert into STUDENT values(103,'Neema','Poulose','Punneli','Ernakulam','k','682017');
Query OK, 1 row affected (0.07 sec)

mysql> insert into STUDENT values(103,'Aleena','Poulose','Kizhakepadam','kannur','k','682040');
> insert into STUDENT values(103,'Aleena','Poulose','Kizhakepadam','kannur','k','682040');
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for
insert into STUDENT values(103,'Aleena','Poulose','Kizhakepadam','' at line 1
mysql> insert into STUDENT values(103,'Aleena','Poulose','Kizhakepadam','kannur','k','682040');
ERROR 1062 (23000): Duplicate entry '103' for key 'student.PRIMARY'
mysql> insert into STUDENT values(104,'Aleena','Poulose','Kizhakepadam','kannur','k','682040');
Query OK, 1 row affected (0.11 sec)

mysql> insert into STUDENT values(105,'Farsana','Salim','Tharayil','kollam','k','682640');
Query OK, 1 row affected (0.07 sec)

mysql> select * from STUDENT;
+-----+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Stud_address | Stud_City | State | PostalCode |
+-----+-----+-----+-----+-----+-----+
| 101 | Asha | Thomas | Areekkal | Thrissur | k | 682017 |
| 102 | Nimisha | NM | Azhimugam | Ernakulam | k | 682036 |
| 103 | Neema | Poulose | Punneli | Ernakulam | k | 682017 |
| 104 | Aleena | Poulose | Kizhakepadam | kannur | k | 682040 |
| 105 | Farsana | Salim | Tharayil | kollam | k | 682640 |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql>

```

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

```

Command Prompt - mysql -u root -p
+-----+
9 rows in set (0.04 sec)

mysql> insert into COURSE values('20MCA60','DATA MINING',4,2);
ERROR 1406 (22001): Data too long for column 'Course_Code' at row 1
mysql> insert into COURSE values('MCA60','DATA MINING',4,2);
Query OK, 1 row affected (0.07 sec)

mysql> desc COURSE;
+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+
| Course_Code | varchar(6)    | NO   | PRI | NULL    |       |
| Course_Title | varchar(25)   | YES  |     | NULL    |       |
| Course_Hours | decimal(2,0)  | YES  |     | NULL    |       |
| Semester    | varchar(8)    | YES  |     | NULL    |       |
+-----+
4 rows in set (0.16 sec)

mysql> select * from COURSE;
+-----+
| Course_Code | Course_Title | Course_Hours | Semester |
+-----+
| 20MCA1      | AI           | 10           | 5         |
| 20MCA2      | MFCS        | 4            | 1         |
| 20MCA3      | ADS          | 3            | 1         |
| 20MCA4      | DIGITAL      | 4            | 1         |
| 20MCA5      | LAB1         | 5            | 2         |
| 20MCA6      | LAB2         | 7            | 3         |
| 20MCA7      | LAB3         | 8            | 5         |
| 20MCA8      | LAB4         | 9            | 5         |
| 20MCA9      | LAB5         | 10           | 5         |
| MCA60       | DATA MINING | 4            | 2         |
+-----+
10 rows in set (0.05 sec)

```

10. Add a new section for this new course with section ID as 301. 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 course.

```

Command Prompt - mysql -u root -p
near 'MW','BLGNG102',35,0,3,'20MCA1');

insert into SECTION values(301,'2-4','MW','BLG' at line 1
mysql> insert into SECTION values(301,'2-4','MW','BLGNG102',35,0,3,'20MCA1');
Query OK, 1 row affected (0.34 sec)

mysql> insert into SECTION values(302,'2-4','MW','BLGNG102',35,0,2,'20MCA2');
Query OK, 1 row affected (0.08 sec)

mysql> insert into SECTION values(303,'2-4','MW','BLGNG102',35,0,1,'20MCA3');
Query OK, 1 row affected (0.08 sec)

mysql> select * from SECTION;
+-----+
| Section_id | Time_offered | Days_offered | section_room | Class_size | Number_enrolled | Instructor_id | Course_Code |
+-----+
| 301        | -2           | MW           | BLGNG102    | 35         | 0               | 3             | 20MCA1      |
| 302        | -2           | MW           | BLGNG102    | 35         | 0               | 2             | 20MCA2      |
| 303        | -2           | MW           | BLGNG102    | 35         | 0               | 1             | 20MCA3      |
+-----+
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 ENROLMENT table. The grade should be null.

stud_no	section_id	grade
101	201	
101	301	
102	301	
103	301	

4 rows in set (0.00 sec)

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

```
Database changed
mysql> update section set class_size=class_size*(class_size*10/100) where section_id=301;
Query OK, 1 row affected, 1 warning (0.20 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	Thu	BL020302	39	0	3	20MCA1
302	-2	Thu	BL020302	35	0	2	20MCA2
303	-2	Thu	BL020302	35	0	1	20MCA3

3 rows in set (0.04 sec)

```
mysql>
```

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

```
mysql> select * from INSTRUCTOR;
```

Instructor_id	Instructor_name	Instructor_fname	Instructor_phone	salary
201	Asha		98642575	200000
202	Ashna		98642544	245670
203	Sandeep		93342544	255670
204	Asif		93366544	200070
205	George		93366664	333330

5 rows in set (0.06 sec)

```
mysql> update INSTRUCTOR set salary=salary*(salary*10/100);
ERROR 1106 (42502): Table 'cyber_college.instructor' doesn't exist
mysql> update INSTRUCTOR set salary=salary*(salary*10/100);
Query OK, 5 rows affected (0.10 sec)
Rows matched: 5 Changed: 5 Warnings: 0

mysql> select * from INSTRUCTOR;
```

Instructor_id	Instructor_name	Instructor_fname	Instructor_phone	salary
201	Asha		98642575	220000
202	Ashna		98642544	270237
203	Sandeep		93342544	281237
204	Asif		93366544	220077
205	George		93366664	366663

5 rows in set (0.00 sec)

```
mysql>
```

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



```

mysql> delete from SECTION where Section_id=302;
Query OK, 1 row affected (0.36 sec)

mysql> select * from SECTION;
+-----+-----+-----+-----+-----+-----+-----+
| Section_id | Time_offered | Days_offered | section_room | Class_size | Number_enrolled | Instructor_id | Course_Code |
+-----+-----+-----+-----+-----+-----+-----+
| 301 | -2 | MW | BLGG102 | 39 | 0 | 3 | 20MCA1 |
| 303 | -2 | MW | BLGG102 | 35 | 0 | 1 | 20MCA3 |
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> select * from ENROLMENT;
Empty set (0.04 sec)

mysql>

```

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.

```

Database changed
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.



```
Command Prompt - mysql -u root -p

mysql> CREATE USER 'U1' IDENTIFIED BY '12345678';
Query OK, 0 rows affected (0.93 sec)

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 ENTROLMENT TO U1;
ERROR 1146 (42S02): Table 'cyber_college.ENTROLMENT' doesn't exist
mysql> GRANT SELECT,UPDATE ON ENROLMENT TO U1;
Query OK, 0 rows affected (0.10 sec)

mysql> SHOW GRANTS FOR 'U1';
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 'GRANTS FOR 'U1'' at line 1
mysql> SHOW GRANTS FOR 'U1';
+-----+
| Grants for U1@% |
+-----+
| GRANT USAGE ON *.* TO 'U1'@'%' |
| GRANT SELECT, UPDATE ON 'cyber_college`.`enrolment` TO 'U1'@'%' |
+-----+
2 rows in set (0.04 sec)

mysql>
```

18. Revoke the delete privilege from U1

```
Command Prompt - mysql -u root -p

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

mysql> REVOKE delete ON enrolment FROM U1;
ERROR 1046 (3D000): No database selected
mysql> REVOKE delete ON ENROLMENT FROM U1;
ERROR 1046 (3D000): No database selected
mysql> REVOKE delete ON ENROLMENT FROM U1;
ERROR 1046 (3D000): No database selected
mysql> use cyber_college;
Database changed
mysql> REVOKE delete ON ENROLMENT FROM U1;
Query OK, 0 rows affected (0.09 sec)

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

mysql>
```

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

```

mysql> select * from STUDENT;
+-----+-----+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Stud_address | Stud_City | State | PostalCode |
+-----+-----+-----+-----+-----+-----+-----+
| 101     | Asha       | Thomas     | Areekkal    | Thrissur  | k     | 682017     |
| 102     | Nimisha    | MM         | Azhimugam   | Ernakulam | k     | 682036     |
| 103     | Neema      | Poulose    | Punnelli    | Ernakulam | k     | 682017     |
| 104     | Aleena     | Poulose    | Kizhakepadam | kannur    | k     | 682040     |
| 105     | Farsana    | Salim      | Tharayil    | kollam    | k     | 682640     |
+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.06 sec)

mysql> select Stud_lname,Stud_fname,Stud_address from STUDENT where Stud_City='ERNAKULAM';
+-----+-----+-----+
| Stud_lname | Stud_fname | Stud_address |
+-----+-----+-----+
| Nimisha    | MM         | Azhimugam   |
| Neema      | Poulose    | Punnelli    |
+-----+-----+-----+
2 rows in set (0.00 sec)

mysql>

```

20. List the student details who has longest first name

```

mysql> use cyber_college;
Database changed
mysql> select * from STUDENT;
+-----+-----+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Stud_address | Stud_City | State | PostalCode |
+-----+-----+-----+-----+-----+-----+-----+
| 101     | Asha       | Thomas     | Areekkal    | Thrissur  | k     | 682017     |
| 102     | Nimisha    | MM         | Azhimugam   | Ernakulam | k     | 682036     |
| 103     | Neema      | Poulose    | Punnelli    | Ernakulam | k     | 682017     |
| 104     | Aleena     | Poulose    | Kizhakepadam | kannur    | k     | 682040     |
| 105     | Farsana    | Salim      | Tharayil    | kollam    | k     | 682640     |
+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> select * from STUDENT where length(Stud_fname)=(select max(length(Stud_lname))from STUDENT);
+-----+-----+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Stud_address | Stud_City | State | PostalCode |
+-----+-----+-----+-----+-----+-----+-----+
| 103     | Neema      | Poulose    | Punnelli    | Ernakulam | k     | 682017     |
| 104     | Aleena     | Poulose    | Kizhakepadam | kannur    | k     | 682040     |
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.10 sec)

mysql>

```

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

```

mysql> select Instructor_lname, Instructor_phone from Instructor i join Course c join Section s where i.Instructor_id=s.Instructor_id and s.Course_Code=c.Course_Code and c.Course_Title='AOS'or'ADBMS';
Empty 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.

```

Command Prompt - mysql -u root -p
2 rows in set (0.10 sec)

mysql> select * from COURSE;
+-----+-----+-----+-----+
| Course_Code | Course_Title | Course_Hours | Semester |
+-----+-----+-----+-----+
| 20MCA1      | AI           | 10           | 5         |
| 20MCA2      | MFCS        | 4            | 1         |
| 20MCA3      | ADS         | 3            | 1         |
| 20MCA4      | DIGITAL     | 4            | 1         |
| 20MCA5      | LAB1        | 5            | 2         |
| 20MCA6      | LAB2        | 7            | 3         |
| 20MCA7      | LAB3        | 8            | 5         |
| 20MCA8      | LAB4        | 9            | 5         |
| 20MCA9      | LAB5        | 10           | 5         |
| MCA60       | DATA MINING | 4            | 2         |
+-----+-----+-----+-----+
10 rows in set (0.04 sec)

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 |
+-----+-----+-----+
| MCA60       | DATA MINING | 4            |
| 20MCA4      | DIGITAL     | 4            |
| 20MCA2      | MFCS        | 4            |
+-----+-----+-----+
3 rows in set (0.04 sec)

mysql>

```

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

```

Command Prompt - mysql -u root -p
+-----+-----+-----+
| 20MCA4 | DIGITAL | 4 |
| 20MCA2 | MFCS    | 4 |
+-----+-----+-----+
3 rows in set (0.04 sec)

mysql> select * from STUDENT;
+-----+-----+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Stud_address | Stud_City | State | PostalCode |
+-----+-----+-----+-----+-----+-----+-----+
| 101     | Asha       | Thomas    | Areekkal    | Thrissur  | k     | 682017     |
| 102     | Ninisha   | MM        | Azhimugam   | Ernakulam | k     | 682036     |
| 103     | Neema     | Pouluse   | Punnelli    | Ernakulam | k     | 682017     |
| 104     | Aleena    | Pouluse   | Kizhakepadam | kannur    | k     | 682040     |
| 105     | Farsana   | Salin     | Tharayil    | kollam    | k     | 682640     |
+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> select Stud_fname,Stud_lname from STUDENT order by Stud_fname desc;
+-----+-----+
| Stud_fname | Stud_lname |
+-----+-----+
| Thomas    | Asha       |
| Salin     | Farsana    |
| Pouluse   | Neema     |
| Pouluse   | Aleena     |
| MM        | Ninisha    |
+-----+-----+
5 rows in set (0.00 sec)

mysql>

```

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

```

mysql> select Student.Stud_No,Student.Stud_lname,Student.Stud_fname,Student.Course_Code,Student.Section_Id from Student inner join ENROLMENT on Student.Stud_No=ENROLMENT.Stud_No and Student.Stud_lname=ENROLMENT.Stud_lname and Student.Stud_fname=ENROLMENT.Stud_fname
+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Course_Code | Section_Id |
+-----+-----+-----+-----+-----+
| 101     | Asha       | Thomas    | 20MCA4      | 100        |
| 102     | Ninisha   | MM        | 20MCA2      | 100        |
+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)

mysql> select Student.Stud_No,Student.Stud_lname,Student.Stud_fname,Student.Course_Code,Student.Section_Id from Student inner join ENROLMENT on Student.Stud_No=ENROLMENT.Stud_No and Student.Stud_lname=ENROLMENT.Stud_lname and Student.Stud_fname=ENROLMENT.Stud_fname
+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Course_Code | Section_Id |
+-----+-----+-----+-----+-----+
| 101     | Asha       | Thomas    | 20MCA4      | 100        |
| 102     | Ninisha   | MM        | 20MCA2      | 100        |
+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)

```

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

```
mysql> select STUDENT.Stud_fname,STUDENT.Stud_lname,ENROLMENT.Section_id,ENROLMENT.Grade from STUDENT inner join ENROLMENT on STUDENT.Stud_No=ENROLME
NT.Stud_No;
Empty set (0.00 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.

```
Command Prompt - mysql -u root -p
mysql> select * from STUDENT;
+----+-----+-----+-----+-----+-----+-----+
| Stud_No | Stud_lname | Stud_fname | Stud_address | Stud_City | State | PostalCode |
+----+-----+-----+-----+-----+-----+-----+
| 101 | Asha | Thomas | Areekkal | Thrissur | k | 682017 |
| 102 | Nimisha | MM | Azhimugam | Ernakulam | k | 682036 |
| 103 | Neema | Poulose | Punneli | Ernakulam | k | 682017 |
| 104 | Aleena | Poulose | Kizhakepadam | kannur | k | 682040 |
| 105 | Farsana | Salim | Tharayil | kollam | k | 682640 |
+----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> select STUDENT.Stud_fname,STUDENT.Stud_lname,ENROLMENT.Section_id,ENROLMENT.grade from STUDENT left join
ENROLMENT on STUDENT.Stud_No=ENROLMENT.Stud_No;
+----+-----+-----+-----+
| Stud_fname | Stud_lname | Section_id | grade |
+----+-----+-----+-----+
| Thomas | Asha | NULL | NULL |
| MM | Nimisha | NULL | NULL |
| Poulose | Neema | NULL | NULL |
| Poulose | Aleena | NULL | NULL |
| Salim | Farsana | NULL | NULL |
+----+-----+-----+-----+
5 rows in set (0.07 sec)

mysql>
```

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

```
Command Prompt - mysql -u root -p
mysql> update INSTRUCTOR set salary=salary+(salary*7/100)where salary < (select avg(salary));
Query OK, 0 rows affected (0.15 sec)
Rows matched: 0 Changed: 0 Warnings: 0

mysql> select * from INSTRUCTOR;
+----+-----+-----+-----+-----+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | salary |
+----+-----+-----+-----+-----+
| 201 | Asha | | 98642575 | 220000 |
| 202 | Ashna | | 98642544 | 270237 |
| 203 | Sandeep | | 93342544 | 281237 |
| 204 | Asif | | 93366544 | 220077 |
| 205 | George | | 93366664 | 366663 |
+----+-----+-----+-----+-----+
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.

```
Command Prompt - mysql -u root -p

mysql> select * from INSTRUCTOR;
+-----+-----+-----+-----+-----+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | salary |
+-----+-----+-----+-----+-----+
| 201           | Asha             |                  | 98642575         | 220000 |
| 202           | Ashna            |                  | 98642544         | 270237 |
| 203           | Sandeep          |                  | 93342544         | 281237 |
| 204           | Asif             |                  | 93366544         | 220077 |
| 205           | George           |                  | 93366664         | 366663 |
+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> select Instructor_lname,salary from INSTRUCTOR where salary=(select max(salary) from INSTRUCTOR)and Instruct
uctor_lname in(select Instructor_lname from INSTRUCTOR where Instructor_lname like '%a');
ERROR 1146 (42S02): Table 'cyber_college.instructor' doesn't exist
mysql> select Instructor_lname,salary from INSTRUCTOR where salary=(select max(salary) from INSTRUCTOR)and Instruct
uctor_lname in(select Instructor_lname from INSTRUCTOR where Instructor_lname like '%a');
ERROR 1054 (42S22): Unknown column 'Instructor_lname' in 'field list'
mysql> select Instructor_lname,salary from INSTRUCTOR where salary=(select max(salary) from INSTRUCTOR)and Instruct
or_lname in(select Instructor_lname from INSTRUCTOR where Instructor_lname like '%a');
ERROR 1054 (42S22): Unknown column 'Intuctor_lname' in 'IN/ALL/ANY subquery'
mysql> select Instructor_lname,salary from INSTRUCTOR where salary=(select max(salary) from INSTRUCTOR)and Instruc
tor_lname in(select Instructor_lname from INSTRUCTOR where Instructor_lname like '%a');
Empty set (0.05 sec)

mysql>
```

29. Display the details of instructor who draws lowest salary

```
Command Prompt - mysql -u root -p

Empty set (0.00 sec)

mysql> select * from INSTRUCTOR;
+-----+-----+-----+-----+-----+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | salary |
+-----+-----+-----+-----+-----+
| 201           | Asha             |                  | 98642575         | 220000 |
| 202           | Ashna            |                  | 98642544         | 270237 |
| 203           | Sandeep          |                  | 93342544         | 281237 |
| 204           | Asif             |                  | 93366544         | 220077 |
| 205           | George           |                  | 93366664         | 366663 |
+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> select INSTRUCTOR where salary=(select min(salary) from INSTRUCTOR);
ERROR 1054 (42S22): Unknown column 'INSTRUCTOR' in 'field list'
mysql> select INSTRUCTOR where salary=(select min(salary) from INSTRUCTOR);
ERROR 1054 (42S22): Unknown column 'INSTRUCTOR' in 'field list'
mysql> select * from INSTRUCTOR where salary=(select min(salary) from INSTRUCTOR);
+-----+-----+-----+-----+-----+
| Instructor_id | Instructor_lname | Instructor_fname | Instructor_phone | salary |
+-----+-----+-----+-----+-----+
| 201           | Asha             |                  | 98642575         | 220000 |
+-----+-----+-----+-----+-----+
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_lname	Stud_fname	Stud_address	Stud_City	State	PostalCode
101	Asha	Thomas	Areekkal	Thrissur	k	682017
102	Nimisha	MM	Azhimugam	Ernakulam	k	682036
103	Neema	Poulose	Punneli	Ernakulam	k	682017
104	Aleena	Poulose	Kizhakepadam	kannur	k	682040
105	Farsana	Salim	Tharayil	kollam	k	682640

```
5 rows in set (0.17 sec)
```

```
mysql> select * from STUDENT where Stud_City='ernakulam' and 'k' or 'banglore' and 'karnataka' or Stud_City in('ernakulam','k','banglore','karnataka');
```

Stud_No	Stud_lname	Stud_fname	Stud_address	Stud_City	State	PostalCode
102	Nimisha	MM	Azhimugam	Ernakulam	k	682036
103	Neema	Poulose	Punneli	Ernakulam	k	682017

```
2 rows in set, 2 warnings (0.12 sec)
```

```
mysql>
```