Sheet No. – 01
Assignment No: 1

A. Creation of Tables:

(i). Creation of depts table:

Query:
```
create table depts(
        deptcode char(3) primary key,
        deptname char(30) not null);
```

Inserting values:
```
insert into depts (deptcode, deptname)
values
    ('CE', 'Civil'),
    ('CSE', 'Computer Science'),
    ('ELE', 'Electrical');
```

depts table after insertion of values:

```
+----------+----------------------+
| deptcode | deptname             |
+----------+----------------------+
| CE       | Civil                |
| CSE      | Computer Science     |
| ELE      | Electrical           |
| ETC      | Electronics          |
| IT       | Infromation Technology |
| MEC      | Mechanical           |
+----------+----------------------+
6 rows in set (0.0013 sec)
```

(ii). Creation of students table:
Query:
```
create table students(
        rollno numeric(8) primary key,
        name char(30),
        bdate date check(bdate < '1997-01-01'),
        deptcode char(3) references depts(deptcode)
        on delete cascade,
        hostel numeric check(hostel<10),
        parent_inc numeric(8,1));
```

Inserting values:

insert into students (rollno, name, bdate, deptcode, hostel, parent_inc)
values

        (92005101, 'Oishika Dutta', '1996-07-22', 'CSE', 4, 370000.0),

        (92005102, 'Lasiewdor Rapsang', '1996-12-05', 'IT', 4, 450000.0),

        (92005108, 'Debargha Ghosh', '1996-09-09', 'ELE', 5, 88630.0),

        (92005201, 'Anish Banerjee', '1995-08-03', 'CSE', 7, 500000.0);

students table after insertion of values:

```
+----------+------------------+------------+----------+--------+------------+
| rollno   | name             | bdate      | deptcode | hostel | perent_inc |
+----------+------------------+------------+----------+--------+------------+
| 92005101 | Oishika Dutta    | 1996-07-22 | CSE      |      4 |   370000.0 |
| 92005102 | Lasiewdor Rapsang| 1996-12-05 | IT       |      4 |   450000.0 |
| 92005108 | Debargha Ghosh   | 1996-09-09 | ELE      |      5 |    88630.0 |
| 92005201 | Anish Banerjee   | 1995-08-03 | CSE      |      7 |   500000.0 |
| 92005205 | Fardeen Hossain  | 1995-08-10 | CSE      |      7 |   420000.0 |
| 92005207 | Ashish Kumar     | 1996-11-12 | IT       |      2 |   440000.0 |
| 92005208 | Rahul Hansda     | 1994-12-16 | MEC      |      6 |   150000.0 |
| 92005215 | Tanis Ahamed     | 1995-09-15 | ELE      |      5 |   250000.0 |
| 92005219 | Sanmai Reddy     | 1995-06-19 | ETC      |      5 |    80000.0 |
| 92005220 | Anudeep Mondal   | 1992-11-24 | CE       |      6 |   400000.0 |
| 92005222 | Ayush Yadav      | 1995-10-18 | MEC      |      2 |   540000.0 |
| 92005224 | Vinita Yadav     | 1995-06-23 | CSE      |      3 |    70000.0 |
| 92005225 | Joyabrata Acharyya| 1993-07-09 | ELE     |      7 |   100000.0 |
| 92005230 | Tausif Islam     | 1994-06-27 | ETC      |      7 |   335000.0 |
| 92005232 | Swarnila Roy     | 1996-02-20 | IT       |      4 |   320000.0 |
| 92005234 | Tanmoy Paul      | 1996-01-12 | MEC      |      7 |   540000.0 |
| 92005242 | Pushpender Singh | 1994-09-18 | IT       |      6 |   240000.0 |
| 92005245 | Sangita Basak    | 1995-06-23 | CE       |      3 |   300000.0 |
| 92005249 | Devika Simlai    | 1994-10-19 | ETC      |      4 |   670000.0 |
| 92005259 | Ankita Das       | 1995-04-30 | CE       |      3 |    90000.0 |
| 92005260 | Sudip Datta      | 1996-03-10 | ETC      |      6 |    82000.0 |
| 92005264 | Sayak Saha       | 1995-01-24 | CE       |      6 |   460000.0 |
| 92005267 | Ishan Dasgupta   | 1995-05-10 | ELE      |      6 |   250000.0 |
| 92005281 | Sourik Saha      | 1994-03-26 | CSE      |      2 |    84000.0 |
| 92005288 | Vamsi Swarup     | 1995-07-09 | ELE      |      7 |   360000.0 |
| 92005290 | Ustav Kumar      | 1994-09-26 | MEC      |      5 |   250000.0 |
+----------+------------------+------------+----------+--------+------------+
26 rows in set (0.0018 sec)
```

(iii). Creation of faculty table:

Query:

create table faculty(
      fac_code char(8) primary key,
      fac_name char(30) not null,
      fac_dept char(3) references depts(deptcode));

Inserting values:

insert into faculty (fac_code, fac_name, fac_dept)
values
  ('AB', 'Aritra Banyopadhyay', 'ELE'),
  ('ARB', 'Aheli Roy Banerjee', 'MEC'),

('dbp', 'Bipradeep Bera', 'ETC'),
('MT', 'Manas Tripathi', 'CSE'),
('nls', 'Pratik Srivastav', 'CE');

faculty table after insertion of values:

```
+----------+--------------------+----------+
| fac_code | fac_name           | fac_dept |
+----------+--------------------+----------+
| AB       | Aritra Banyopadhyay | ELE     |
| ARB      | Aheli Roy Banerjee  | MEC     |
| dbp      | Bipradeep Bera      | ETC     |
| MT       | Manas Tripathi      | CSE     |
| nls      | Pratik Srivastav    | CE      |
| PB       | Prithijit Banerjee  | IT      |
| PM       | Prayas Mazumder     | CSE     |
| RS       | Raj Shah            | CE      |
| SS       | Sankhya Samanta     | ELE     |
| YK       | Yashwanth Kota      | IT      |
+----------+--------------------+----------+
10 rows in set (0.0013 sec)
```

(iv). Creation of crs_offrd(course offered) table:

Query:
create table crs_offrd(
        crs_code char(5) primary key,
        crs_name char(35) not null,
        crs_credits numeric(2,1),
        crs_fac_cd char(8) references faculty(fac_code));

Inserting values:
insert into crs_offrd (crs_code, crs_name, crs_credits, crs_fac_cd)
values
    ('CE201', 'Water Resources', 6.0, 'RS'),
    ('CE204', 'Building Material', 8.2, 'nls'),
    ('CS101', 'OS', 9.0, 'PM'),
    ('CS201', 'Software Engg', 8.5, 'MT'),
    ('CS207', 'DBMS', 8.0, 'PM');

crs_offrd table after insertion of values:

```
+----------+----------------------+-------------+------------+
| crs_code | crs_name             | crs_credits | crs_fac_cd |
+----------+----------------------+-------------+------------+
| CE201    | Water Resources      |         6.0 | RS         |
| CE204    | Building Material     |         8.2 | nls        |
| CS101    | OS                   |         9.0 | PM         |
| CS201    | Software Engg        |         8.5 | MT         |
| CS207    | DBMS                 |         8.0 | PM         |
| EC202    | Control Signal       |         6.3 | dbp        |
| EC203    | Communication System |         5.6 | dbp        |
| EE101    | Basic Electrical Engg|         7.5 | SS         |
| EE201    | Induction Motor      |         7.0 | AB         |
| IT106    | Automata Theory      |         8.0 | YK         |
| IT201    | Digital Logic        |         4.9 | PB         |
| ME208    | Fluid Mechanics      |         9.3 | ARB        |
| PH106    | Quantum Phyiscs      |         8.8 | nls        |
+----------+----------------------+-------------+------------+
13 rows in set (0.0015 sec)
```

(iv). Creation of crs_regd(course registered) table:

Query:
create table crs_regd(
     crs_rollno numeric(8) references students(rollno),
     crs_cd char(5) references crs_offrd(crs_code),
     marks numeric(5,2),
     primary key(crs_rollno,crs_cd));

Inserting values:
insert into crs_regd (crs_rollno, crs_cd, marks)
values
  (92005101, 'CS101', 89.00),
  (92005101, 'CS201', 59.00),
  (92005101, 'CS207', 76.00),
  (92005102, 'IT106', 68.00),
  (92005102, 'IT201', 100.00),
  (92005201, 'CS101', 92.00),
  (92005201, 'CS201', 56.00),
  (92005201, 'CS207', 98.00);

crs_regd table after insertion of values:

crs_rollno	crs_cd	marks
92005101	CS101	89.00
92005101	CS201	59.00
92005101	CS207	76.00
92005102	IT106	68.00
92005102	IT201	100.00
92005201	CS101	92.00
92005201	CS201	56.00
92005201	CS207	98.00
92005205	CS101	88.00
92005205	CS201	82.00
92005205	CS207	90.00
92005207	IT106	90.00
92005207	IT201	85.00
92005208	ME208	80.00
92005215	EE101	74.00
92005215	EE201	67.00
92005219	EC202	88.00
92005219	EC203	82.00
92005220	CE201	78.00
92005220	CE204	89.00
92005224	CS101	100.00
92005224	CS201	87.00
92005224	CS207	95.00
92005225	EE101	100.00
92005225	EE201	87.00
92005232	IT106	79.00
92005232	IT201	90.00
92005234	ME208	88.00
92005242	IT106	80.00
92005242	IT201	70.00
92005245	CE201	95.00
92005245	CE204	85.00
92005249	EC202	80.00
92005249	EC203	87.00
92005259	CE201	45.00
92005259	CE204	59.00
92005260	EC202	77.00
92005260	EC203	76.00
92005264	CE201	75.00
92005264	CE204	79.00
92005281	CS101	87.00
92005281	CS201	93.00
92005281	CS207	96.00
92005288	EE101	98.00
92005288	EE201	90.00
92005290	ME208	78.00

46 rows in set (0.0014 sec)

B. Queries and their solutions:

1. Try inserting records which violate the constraints:

```
MySQL  localhost:33060+ ssl  assignment1  SQL > INSERT INTO students (92
005229, 'Sagnik Dutta', '1994-17-12', 'MEC', 7, 470000);
ERROR: 1064: 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
 '92005229, 'Sagnik Dutta', '1994-17-12', 'MEC', 7, 470000)' at line 1
```

Explanation:

Here it is showing error because, while creating the table 'students' , I added a check constraint that is bdate date check(bdate < '1997-01-01'). But here I added '1994-17-12' where correct formatting of date is not used. Therefore check constraint is violated here.

```
MySQL  localhost:33060+ ssl  assignment1  SQL > INSERT INTO students (92
005244, 'Prakriti Roy', '1995-09-08', 'CSE', 12, 300000);
ERROR: 1064: 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
 '92005244, 'Prakriti Roy', '1995-09-08', 'CSE', 12, 300000)' at line 1
```

Explanation:

Here it is showing error because, at the time of creation of table 'students', a check constraint was added that hostel numeric check(hostel<10). But I entered value 12. So check constraint is violated here.

2. Delete records from dept where deptcode='CSE'. (This deletes records from students whose deptcode='CSE'):

Query:
delete from dept
where deptcode='CSE';

Output:

```
+----------+----------------------+
| deptcode | deptname             |
+----------+----------------------+
| CE       | Civil                |
| ELE      | Electrical           |
| ETC      | Electronics          |
| IT       | Infromation Technology |
| MEC      | Mechanical           |
+----------+----------------------+
5 rows in set (0.0004 sec)
```

```
+----------+------------------+------------+----------+--------+------------+
| rollno   | name             | bdate      | deptcode | hostel | perent_inc |
+----------+------------------+------------+----------+--------+------------+
| 92005102 | Lasiewdor Rapsang| 1996-12-05 | IT       |      4 |   450000.0 |
| 92005108 | Debargha Ghosh   | 1996-09-09 | ELE      |      5 |    88630.0 |
| 92005207 | Ashish Kumar     | 1996-11-12 | IT       |      2 |   440000.0 |
| 92005208 | Rahul Hansda     | 1994-12-16 | MEC      |      6 |   150000.0 |
| 92005215 | Tanis Ahamed     | 1995-09-15 | ELE      |      5 |   250000.0 |
| 92005219 | Sanmai Reddy     | 1995-06-19 | ETC      |      5 |    80000.0 |
| 92005220 | Anudeep Mondal   | 1992-11-24 | CE       |      6 |   400000.0 |
| 92005222 | Ayush Yadav      | 1995-10-18 | MEC      |      2 |   540000.0 |
| 92005225 | Joyabrata Acharyya| 1993-07-09 | ELE     |      7 |   100000.0 |
| 92005230 | Tausif Islam     | 1994-06-27 | ETC      |      7 |   335000.0 |
| 92005232 | Swarnila Roy     | 1996-02-20 | IT       |      4 |   320000.0 |
| 92005234 | Tanmoy Paul      | 1996-01-12 | MEC      |      7 |   540000.0 |
| 92005242 | Pushpender Singh | 1994-09-18 | IT       |      6 |   240000.0 |
| 92005245 | Sangita Basak    | 1995-06-23 | CE       |      3 |   300000.0 |
| 92005249 | Devika Simlai    | 1994-10-19 | ETC      |      4 |   670000.0 |
| 92005259 | Ankita Das       | 1995-04-30 | CE       |      3 |    90000.0 |
| 92005260 | Sudip Datta      | 1996-03-10 | ETC      |      6 |    82000.0 |
| 92005264 | Sayak Saha       | 1995-01-24 | CE       |      6 |   460000.0 |
| 92005267 | Ishan Dasgupta   | 1995-05-10 | ELE      |      6 |   250000.0 |
| 92005288 | Vamsi Swarup     | 1995-07-09 | ELE      |      7 |   360000.0 |
| 92005290 | Ustav Kumar      | 1994-09-26 | MEC      |      5 |   250000.0 |
+----------+------------------+------------+----------+--------+------------+
21 rows in set (0.0008 sec)
```

The result shows that the students who have deptocde as 'CSE' are removed from the students as well as from the depts table.

3. Find out the courses offered by the faculty dbp and nls:

Query:
select *
from crs_offrd
where crs_fac_cd IN ('dbp', 'nls');

Output:

```
+----------+---------------------+-------------+------------+
| crs_code | crs_name            | crs_credits | crs_fac_cd |
+----------+---------------------+-------------+------------+
| CE204    | Building Material    |         8.2 | nls        |
| EC202    | Control Signal       |         6.3 | dbp        |
| EC203    | Communication System |         5.6 | dbp        |
| PH106    | Quantum Phyiscs      |         8.8 | nls        |
+----------+---------------------+-------------+------------+
4 rows in set (0.0012 sec)
```

4. Find out the courses with full details offered by dbp:

Query:

```
select *
from crs_offrd
where crs_fac_cd = 'dbp';
```

Output:

```
+----------+---------------------+-------------+------------+
| crs_code | crs_name            | crs_credits | crs_fac_cd |
+----------+---------------------+-------------+------------+
| EC202    | Control Signal      |         6.3 | dbp        |
| EC203    | Communication System|         5.6 | dbp        |
+----------+---------------------+-------------+------------+
2 rows in set (0.0013 sec)
```

5. **Get the courses the credits of which lies between 4.0 and 6.0:**

   Query:

   ```
   select *
   from crs_offrd
   where crs_credits BETWEEN 4.0 AND 6.0;
   ```

   Output:

   ```
   +----------+---------------------+-------------+------------+
   | crs_code | crs_name            | crs_credits | crs_fac_cd |
   +----------+---------------------+-------------+------------+
   | CE201    | Water Resources     |         6.0 | RS         |
   | EC203    | Communication System|         5.6 | dbp        |
   | IT201    | Digital Logic       |         4.9 | PB         |
   +----------+---------------------+-------------+------------+
   3 rows in set (0.0012 sec)
   ```

6. **Get the courses the credits of which are > 6.5:**

   Query:
   ```
   select *
   from crs_offrd
   where crs_credits > 6.5;
   ```

   Output:

   ```
   +----------+----------------------+-------------+------------+
   | crs_code | crs_name             | crs_credits | crs_fac_cd |
   +----------+----------------------+-------------+------------+
   | CE204    | Building Material     |         8.2 | nls        |
   | CS101    | OS                    |         9.0 | PM         |
   | CS201    | Software Engg         |         8.5 | MT         |
   | CS207    | DBMS                  |         8.0 | PM         |
   | EE101    | Basic Electrical Engg |         7.5 | SS         |
   | EE201    | Induction Motor       |         7.0 | AB         |
   | IT106    | Automata Theory       |         8.0 | YK         |
   | ME208    | Fluid Mechanics       |         9.3 | ARB        |
   | PH106    | Quantum Phyiscs       |         8.8 | nls        |
   +----------+----------------------+-------------+------------+
   9 rows in set (0.0012 sec)
   ```

Assignment No : 2

1. **Count the number of students in CSE dept:**

   Query:
   select COUNT(*) AS num_students
   from students
   where deptcode = 'CSE';

   Output:

   ```
   +---------------+
   | num_students  |
   +---------------+
   |             5 |
   +---------------+
   1 row in set (0.0019 sec)
   ```

2. **Determine the minimum, maximum and average marks of each courses:**

   Query:
   select crs_cd,
        MIN(marks) AS min_marks,
        MAX(marks) AS max_marks,
        AVG(marks) AS avg_marks
   from crs_regd
   GROUP BY crs_cd;

   Output:

   ```
   +--------+-----------+-----------+-----------+
   | crs_cd | min_marks | max_marks | avg_marks |
   +--------+-----------+-----------+-----------+
   | CS101  |     87.00 |    100.00 | 91.200000 |
   | CS201  |     56.00 |     93.00 | 75.400000 |
   | CS207  |     76.00 |     98.00 | 91.000000 |
   | IT106  |     68.00 |     90.00 | 79.250000 |
   | IT201  |     70.00 |    100.00 | 86.250000 |
   | ME208  |     78.00 |     88.00 | 82.000000 |
   | EE101  |     74.00 |    100.00 | 90.666667 |
   | EE201  |     67.00 |     90.00 | 81.333333 |
   | EC202  |     77.00 |     88.00 | 81.666667 |
   | EC203  |     76.00 |     87.00 | 81.666667 |
   | CE201  |     45.00 |     95.00 | 73.250000 |
   | CE204  |     59.00 |     89.00 | 78.000000 |
   +--------+-----------+-----------+-----------+
   12 rows in set (0.0034 sec)
   ```

3. Determine the total credits of the courses registered by a student:

Query:
select cr.crs_rollno, SUM(co.crs_credits) AS total_credits
from crs_regd cr, crs_offrd co where cr.crs_cd = co.crs_code
group by cr.crs_rollno;

Output:

```
+------------+---------------+
| crs_rollno | total_credits |
+------------+---------------+
|   92005101 |          25.5 |
|   92005102 |          12.9 |
|   92005201 |          25.5 |
|   92005205 |          25.5 |
|   92005207 |          12.9 |
|   92005208 |           9.3 |
|   92005215 |          14.5 |
|   92005219 |          11.9 |
|   92005220 |          14.2 |
|   92005224 |          25.5 |
|   92005225 |          14.5 |
|   92005232 |          12.9 |
|   92005234 |           9.3 |
|   92005242 |          12.9 |
|   92005245 |          14.2 |
|   92005249 |          11.9 |
|   92005259 |          14.2 |
|   92005260 |          11.9 |
|   92005264 |          14.2 |
|   92005281 |          25.5 |
|   92005288 |          14.5 |
|   92005290 |           9.3 |
+------------+---------------+
22 rows in set (0.0017 sec)
```

4. Count the number of students in each hostel whose department is CSE:

Query:
select s.hostel, COUNT(*) AS num_students
from students s
where s.deptcode = 'CSE'
group by s.hostel;

Output:

```
+--------+--------------+
| hostel | num_students |
+--------+--------------+
|      4 |            1 |
|      7 |            2 |
|      3 |            1 |
|      2 |            1 |
+--------+--------------+
4 rows in set (0.0013 sec)
```

5. **Display the hostel, rollno, parent_inc of the student who has the max(parent_inc) in a hostel:**

Query:
Select hostel, rollno, perent_inc
from students
where perent_inc in (select max(perent_inc)
                                from students
                                group by hostel)
ORDER BY hostel;

Output:
```
+--------+----------+------------+
| hostel | rollno   | perent_inc |
+--------+----------+------------+
|      2 | 92005222 |   540000.0 |
|      3 | 92005245 |   300000.0 |
|      4 | 92005249 |   670000.0 |
|      5 | 92005215 |   250000.0 |
|      5 | 92005290 |   250000.0 |
|      6 | 92005264 |   460000.0 |
|      6 | 92005267 |   250000.0 |
|      7 | 92005234 |   540000.0 |
+--------+----------+------------+
8 rows in set (0.0021 sec)
```

6. **Display the name and parental income of each student greater than the parental income of some rollno 92005008:**

Query:
select name, perent_inc
from students
where perent_inc > (select perent_inc
                              from students
                              where rollno = 92005208);

Output:

```
+-------------------+------------+
| name              | perent_inc |
+-------------------+------------+
| Oishika Dutta     |   370000.0 |
| Lasiewdor Rapsang |   450000.0 |
| Anish Banerjee    |   500000.0 |
| Fardeen Hossain   |   420000.0 |
| Ashish Kumar      |   440000.0 |
| Tanis Ahamed      |   250000.0 |
| Anudeep Mondal    |   400000.0 |
| Ayush Yadav       |   540000.0 |
| Tausif Islam      |   335000.0 |
| Swarnila Roy      |   320000.0 |
| Tanmoy Paul       |   540000.0 |
| Pushpender Singh  |   240000.0 |
| Sangita Basak     |   300000.0 |
| Devika Simlai     |   670000.0 |
| Sayak Saha        |   460000.0 |
| Ishan Dasgupta    |   250000.0 |
| Vamsi Swarup      |   360000.0 |
| Ustav Kumar       |   250000.0 |
+-------------------+------------+
18 rows in set (0.0013 sec)
```

7. **Find out marks of students who have marks more than rollno 92005102 for course CH103 and PH106:**

Query:
select crs_rollno, crs_cd, marks
from crs_regd
where(
        (
                crs_cd = 'CE201'
                AND
                marks > (
                                select marks
                                from crs_regd
                                where crs_rollno = 92005102 AND crs_cd = 'CE201'
)
)
        OR
        (
                crs_cd = 'PH106'
                AND
                marks > (
                                select marks
                                from crs_regd

```
                )
        )
);
```

Output:

```
+------------+--------+--------+
| crs_rollno | crs_cd | marks  |
+------------+--------+--------+
|   92005245 | CE201  | 95.00  |
+------------+--------+--------+
1 row in set (0.0019 sec)
```

Assignment No : 3

1. **List students (rollno, name, deptcode) registered for course EE101:**

   Query:
   select rollno, name, deptcode
   from students, crs_regd
   where
           crs_rollno = rollno
           AND crs_cd = 'EE101';

   Output:

```
+----------+-------------------+----------+
| rollno   | name              | deptcode |
+----------+-------------------+----------+
| 92005215 | Tanis Ahamed      | ELE      |
| 92005225 | Joyabrata Acharyya | ELE     |
| 92005288 | Vamsi Swarup      | ELE      |
+----------+-------------------+----------+
3 rows in set (0.0014 sec)
```

2. **List students (rollno, name) in ELE dept registered for course EE101:**
   Query:
   select rollno, name
   from students, crs_regd
   where
           crs_rollno = rollno
           AND deptcode = 'ELE'
           AND crs_cd = 'EE101';

Output:

```
+----------+-------------------+
| rollno   | name              |
+----------+-------------------+
| 92005215 | Tanis Ahamed      |
| 92005225 | Joyabrata Acharyya |
| 92005288 | Vamsi Swarup      |
+----------+-------------------+
3 rows in set (0.0016 sec)
```

3. **List students (rollno, name) in ELE dept not registered for course EE101:**

Query:
select s.rollno, s.name
from students s, crs_regd c
where c.crs_rollno = s.rollno
    AND s.deptcode = 'ELE'
EXCEPT
select s.rollno, s.name
from students s, crs_regd c
where c.crs_rollno = s.rollno
    AND s.deptcode = 'ELE'
    AND c.crs_cd = 'EE101';

Output:

```
MySQL  localhost:33060+ ssl  assignment1  SQL > SELECT s.rollno, s.name
                                           -> FROM students s, crs_regd c
                                           -> WHERE c.crs_rollno = s.rollno
                                           ->    AND s.deptcode = 'ELE'
                                           -> EXCEPT
                                           -> SELECT s.rollno, s.name
                                           -> FROM students s, crs_regd c
                                           -> WHERE c.crs_rollno = s.rollno
                                           ->    AND s.deptcode = 'ELE'
                                           ->    AND c.crs_cd = 'EE101';
Empty set (0.0028 sec)
```

This returns an empty set because there are no students who does not enrolled in any of the courses. ELE department students have enrolled in all the departmental courses.

4. **List the names of the students who have registered for both the courses 'DBMS' and 'OS':**

Query:
select name
from students, crs_regd, crs_offrd
where
        crs_rollno = rollno

```
        AND crs_cd = crs_code
        AND crs_offrd.crs_name = 'DBMS'
INTERSECT
select name
from    students, crs_regd, crs_offrd
where
        crs_rollno = rollno
        AND crs_cd = crs_code
        AND crs_offrd.crs_name = 'OS';
```

Output:

```
+-----------------+
| name            |
+-----------------+
| Oishika Dutta   |
| Anish Banerjee  |
| Fardeen Hossain |
| Vinita Yadav    |
| Sourik Saha     |
+-----------------+
5 rows in set (0.0028 sec)
```

5. **Find the names of the faculty members who have offered either 'Automata Theory' or 'Software Engg.':**

Query:
```
select fac_name
from faculty, crs_offrd
where
        crs_fac_cd = fac_code
        AND crs_name = 'Automata Theory'
UNION
select fac_name
from faculty, crs_offrd
where
        crs_fac_cd = fac_code
        AND crs_name = 'Software Engg';
```

Output:

```
+-----------------+
| fac_name        |
+-----------------+
| Yashwanth Kota  |
| Manas Tripathi  |
+-----------------+
2 rows in set (0.0007 sec)
```

6. **Find the names of the faculty members who have offered 'Automata Theory' but not offered 'Software Engg.':**
Query:
select fac_name from faculty, crs_offrd
where
       fac_code = crs_fac_cd
       AND crs_name = 'Automata Theory'
EXCEPT
select fac_name
from faculty, crs_offrd
where
       fac_code = crs_fac_cd
       AND crs_name = 'Software Engg';

Output:

```
+----------------+
| fac_name       |
+----------------+
| Yashwanth Kota |
+----------------+
1 row in set (0.0006 sec)
```

7. **Find out the students in each hostel who are not registered for any course:**
Query:
(SELECT rollno, name, hostel
 FROM students
 WHERE rollno NOT IN (SELECT crs_rollno FROM crs_regd))
UNION
(SELECT rollno, name, hostel
 FROM students
 WHERE rollno IN (SELECT crs_rollno FROM crs_regd)
    AND rollno NOT IN (SELECT rollno FROM students WHERE rollno IN (SELECT crs_rollno FROM crs_regd)))
ORDER BY hostel;
Output:

```
+----------+----------------+--------+
| rollno   | name           | hostel |
+----------+----------------+--------+
| 92005222 | Ayush Yadav    |      2 |
| 92005108 | Debargha Ghosh |      5 |
| 92005267 | Ishan Dasgupta |      6 |
| 92005230 | Tausif Islam   |      7 |
+----------+----------------+--------+
4 rows in set (0.0008 sec)
```

8. **Select the students who are in ELE dept or who have registered for course CS101:**

Query:
select rollno, name, deptcode
from students
where deptcode = 'ELE'
UNION
select rollno, name, deptcode
from students, crs_regd
where
     rollno = crs_rollno
     AND crs_cd = 'CS101';

Output:

```
+----------+-------------------+----------+
| rollno   | name              | deptcode |
+----------+-------------------+----------+
| 92005108 | Debargha Ghosh    | ELE      |
| 92005215 | Tanis Ahamed      | ELE      |
| 92005225 | Joyabrata Acharyya| ELE      |
| 92005267 | Ishan Dasgupta    | ELE      |
| 92005288 | Vamsi Swarup      | ELE      |
| 92005101 | Oishika Dutta     | CSE      |
| 92005201 | Anish Banerjee    | CSE      |
| 92005205 | Fardeen Hossain   | CSE      |
| 92005224 | Vinita Yadav      | CSE      |
| 92005281 | Sourik Saha       | CSE      |
+----------+-------------------+----------+
10 rows in set (0.0008 sec)
```

9. **Display the students who have registered to all the courses:**

Query:
select crs_rollno, name, deptcode
from students, crs_regd
where rollno = crs_rollno
group by crs_rollno, rollno
HAVING COUNT(*) = (SELECT COUNT(*) from crs_offrd);

Output:

```
MySQL  localhost:33060+ ssl  assignment1  SQL > SELECT crs_rollno, name, deptcode
                                          -> FROM students, crs_regd
                                          -> WHERE rollno = crs_rollno
                                          -> GROUP BY crs_rollno, rollno
                                          -> HAVING COUNT(*) = (SELECT COUNT(*) FROM crs_offrd);
Empty set (0.0045 sec)
```

This returns an empty set because there are no students who has registered to all the courses.

10. **Give Grace Marks 5 in subject 'DBMS' to the students who have scored less than 50 in that subject:**

Query:
```sql
UPDATE crs_regd
SET marks = marks + 5
FROM crs_offrd
WHERE
        crs_code = crs_cd
        AND crs_name = 'DBMS'
        AND marks < 50;
```

Output:

crs_rollno	crs_cd	marks
92005101	CS101	89.00
92005101	CS201	59.00
92005101	CS207	51.00
92005102	IT106	68.00
92005102	IT201	100.00
92005201	CS101	92.00
92005201	CS201	56.00
92005201	CS207	98.00
92005205	CS101	88.00
92005205	CS201	82.00
92005205	CS207	90.00
92005207	IT106	90.00
92005207	IT201	85.00
92005208	ME208	80.00
92005215	EE101	74.00
92005215	EE201	67.00
92005219	EC202	88.00
92005219	EC203	82.00
92005220	CE201	78.00
92005220	CE204	89.00
92005224	CS101	100.00
92005224	CS201	87.00
92005224	CS207	95.00
92005225	EE101	100.00
92005225	EE201	87.00
92005232	IT106	79.00
92005232	IT201	90.00
92005234	ME208	88.00
92005242	IT106	80.00
92005242	IT201	70.00
92005245	CE201	95.00
92005245	CE204	85.00
92005249	EC202	80.00
92005249	EC203	87.00
92005259	CE201	45.00
92005259	CE204	59.00
92005260	EC202	77.00
92005260	EC203	76.00
92005264	CE201	75.00
92005264	CE204	79.00
92005281	CS101	87.00
92005281	CS201	93.00
92005281	CS207	54.00
92005288	EE101	98.00
92005288	EE201	90.00
92005290	ME208	78.00

46 rows in set (0.00 sec)