NAME-Barsha Routh

Reg no-24MCA0164

DATABASE SYSTEMS

PROFESSOR(Prof_id, Prof_name, Email, Mobile, Specialty, Dept_id)

SCHOOL(SCode, Scl_name, Prof_id, Location)

DEPARTMENT(Dept_id, Dname, SCode, Prof_id)

COURSE(Crs_code, Crs_name, Description, Credits, Hours)

CLASS(Cls_code, Slot, Stime, Etime, Crs_code, Prof_id, Room_no, Sem_code, Day_of_week)

SEMESTER(Sem_code, Term, Year, Sdate, Edate)

STUDENT(Reg_no, Sname, Address, DoB, Email, Mobile, Dept_id, Prof_id)

ENROLL(Cls_code, Reg_no, Enroll_time, Grade)

STUDENT_VISA(Reg_no, Visa_status)

PROGRAMME(Prog_code, Prog_name, Prog_preamble, Scode, Dept_id)

1. Create the above tables.

SOLUTION

```
create table PROFESSOR(Prof_id varchar(5),Prof_name varchar(20),Email varchar(20),Mobile
number(10),Speciality varchar(10),Dept_id varchar(5));

create table SCHOOL(SCode varchar(5),Scl_name varchar(20),Prof_id varchar(5),Location varchar(10));

create table DEPARTMENT(Dept_id varchar(5),Dname varchar(20),Scode varchar(5),Prof_id varchar(5));

create table COURSE (Crs_code varchar(5),Crs_name varchar(10),Description varchar(30),Credits
number(2),Hours number(2));

CREATE TABLE CLASS (Cls_code VARCHAR(5),Slot VARCHAR(5),Stime TIMESTAMP(0),Etime
TIMESTAMP(0),Crs_code VARCHAR(5), Prof_id VARCHAR(5),Room_no VARCHAR(5), Sem_code VARCHAR(5),
Day_of_week VARCHAR(10));

Create table SEMESTER(sem_code varchar(5),term varchar(6),Year varchar(4),Sdate date,Edate date);

Create table STUDENT(Reg_no varchar(5),Sname varchar(10),Address varchar(20),DoB date,Email
varchar(20),Mobile varchar(10),Dept_id varchar(5),Prof_id varchar(5));

Create table ENROLL(Cls_code varchar(5),Reg_no varchar(5),Enroll_time timestamp(0), Grade CHAR(1) CHECK
(Grade IN ('S', 'A', 'B', 'C', 'D')));

Create table STUDENT_VISA(Reg_no varchar(5),Visa_status Varchar(20));

Create table PROGRAMME(Prog_code varchar(5), Prog_name varchar(10), Prog_preamble varchar(50), Scode
varchar(5), Dept_id varchar(5));
```

OUTPUT IN THE NEXT QUESTION--

2. Enter data into the above tables. (Learn also how to enter data interactively.). Display the content of each table. Use column formatting while displaying data.

SOLUTION

INTERACTIVE ENTRY OF DATA

insert into PROFESSOR values(&Prof_id,&Prof_name,&Email,&Mobile,&Specialty,&Dept_id);

insert into DEPARTMENT values(&Dept_id, &Dname, &SCode, &Prof_id);

insert into SCHOOL values(&SCode, &Scl_name, &Prof_id , &Location);

insert into COURSE values(&Crs_code , &Crs_name , &Description , &Credits , &Hours);

insert into CLASS values(&Cls_code , &Slot , &Stime , &Etime , &Crs_code , &Prof_id , &Room_no, &Sem_code , &Day_of_week);

insert into SEMESTER values(&Sem_code, &Term , &Year, &Sdate, &Edate);

insert into STUDENT values(&Reg_no , &Sname , &Address, &DoB, &Email , &Mobile, &Dept_id , &Prof_id);

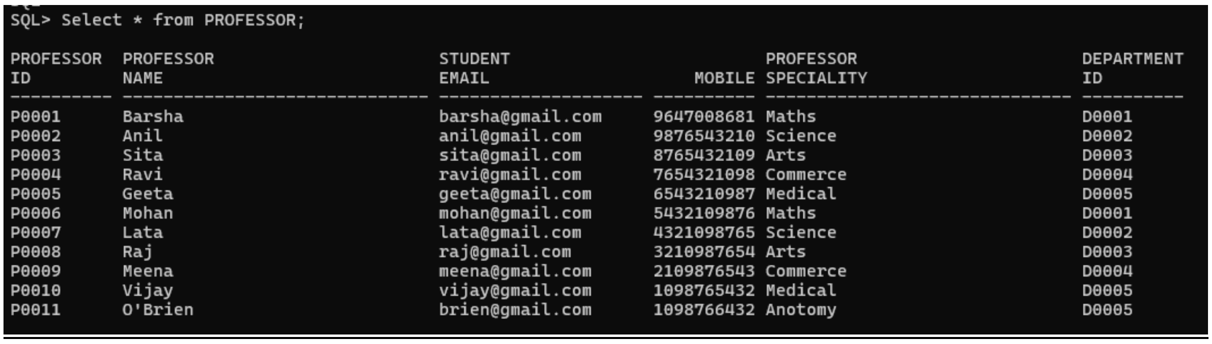
insert into ENROLL values(&Cls_code, &Reg_no , &Enroll_time , &Grade);

insert into STUDENT_VISA values(&Reg_no, &Visa_status);

insert into PROGRAMME values(&Prog_code , &Prog_name, &Prog_preamble, &Scode , &Dept_id);

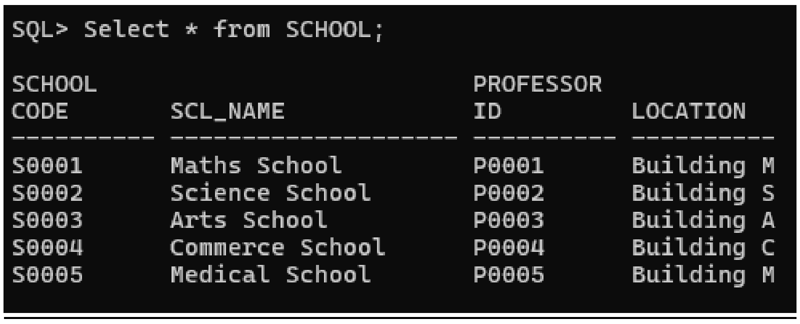
OUTPUT

PROFESSOR



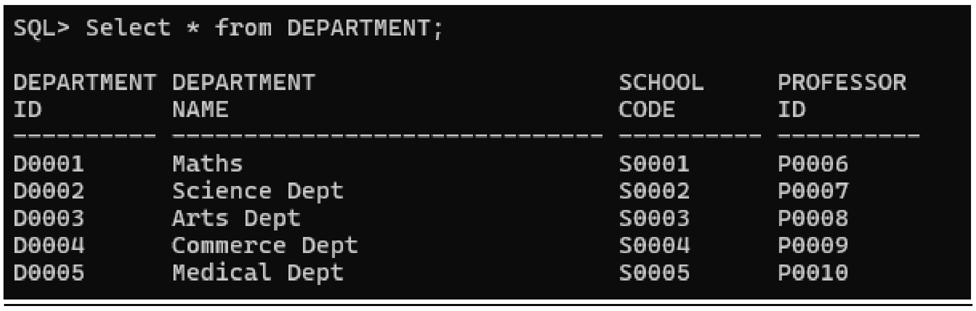
```
SQL> Select * from PROFESSOR;

PROFESSOR  PROFESSOR                      STUDENT                         PROFESSOR                      DEPARTMENT
ID         NAME                           EMAIL                    MOBILE SPECIALITY                     ID
---------- ------------------------------ -------------------- ---------- ------------------------------ ----------
P0001      Barsha                         barsha@gmail.com     9647008681 Maths                          D0001
P0002      Anil                           anil@gmail.com       9876543210 Science                        D0002
P0003      Sita                           sita@gmail.com       8765432109 Arts                           D0003
P0004      Ravi                           ravi@gmail.com       7654321098 Commerce                       D0004
P0005      Geeta                          geeta@gmail.com      6543210987 Medical                        D0005
P0006      Mohan                          mohan@gmail.com      5432109876 Maths                          D0001
P0007      Lata                           lata@gmail.com       4321098765 Science                        D0002
P0008      Raj                            raj@gmail.com        3210987654 Arts                           D0003
P0009      Meena                          meena@gmail.com      2109876543 Commerce                       D0004
P0010      Vijay                          vijay@gmail.com      1098765432 Medical                        D0005
P0011      O'Brien                        brien@gmail.com      1098766432 Anotomy                        D0005
```

SCHOOL



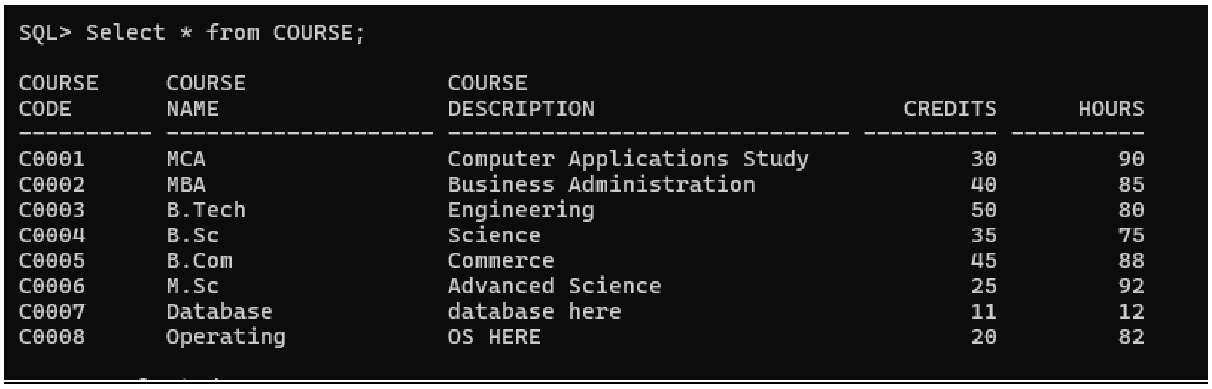
```
SQL> Select * from SCHOOL;

SCHOOL                         PROFESSOR
CODE       SCL_NAME            ID         LOCATION
---------- -------------------- ---------- ----------
S0001      Maths School         P0001      Building M
S0002      Science School       P0002      Building S
S0003      Arts School          P0003      Building A
S0004      Commerce School      P0004      Building C
S0005      Medical School       P0005      Building M
```

DEPARTMENT



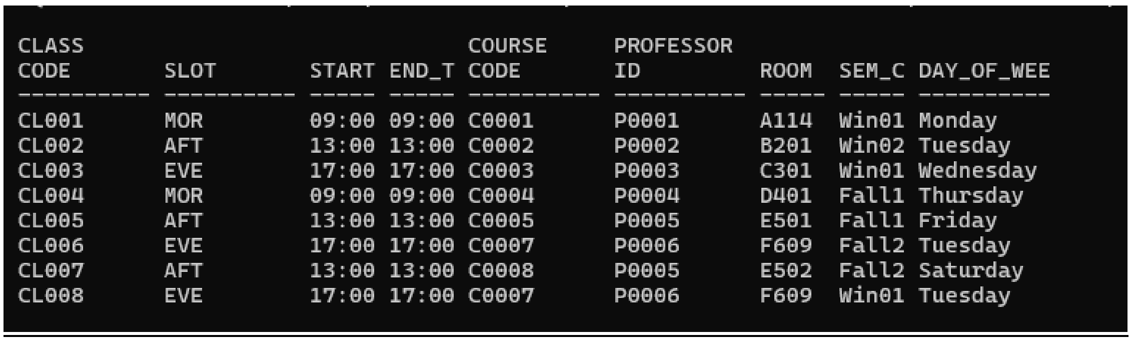
```
SQL> Select * from DEPARTMENT;

DEPARTMENT DEPARTMENT                     SCHOOL     PROFESSOR
ID         NAME                           CODE       ID
---------- ------------------------------ ---------- ----------
D0001      Maths                          S0001      P0006
D0002      Science Dept                   S0002      P0007
D0003      Arts Dept                      S0003      P0008
D0004      Commerce Dept                  S0004      P0009
D0005      Medical Dept                   S0005      P0010
```

COURSE



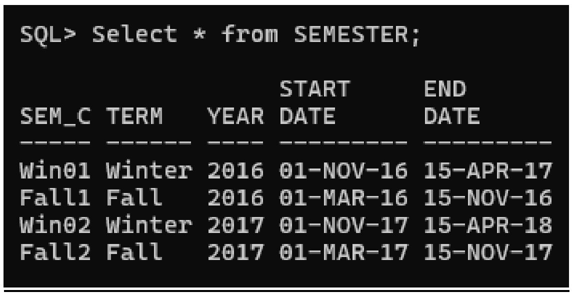
```
SQL> Select * from COURSE;

COURSE     COURSE               COURSE
CODE       NAME                 DESCRIPTION                       CREDITS      HOURS
---------- -------------------- ------------------------------ ---------- ----------
C0001      MCA                  Computer Applications Study            30         90
C0002      MBA                  Business Administration                40         85
C0003      B.Tech               Engineering                            50         80
C0004      B.Sc                 Science                                35         75
C0005      B.Com                Commerce                               45         88
C0006      M.Sc                 Advanced Science                       25         92
C0007      Database             database here                          11         12
C0008      Operating            OS HERE                                20         82
```

CLASS



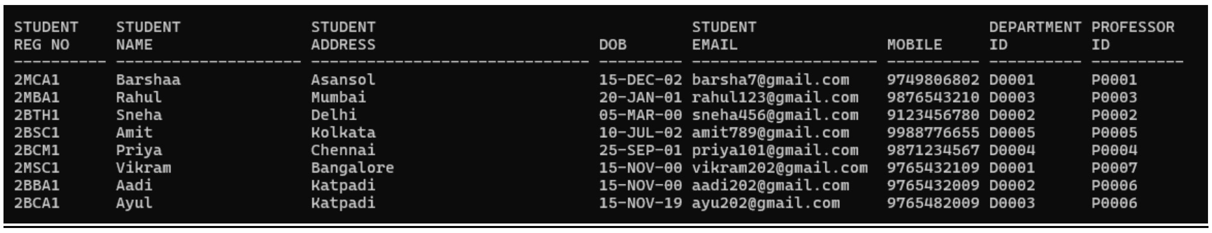
```
CLASS                           COURSE     PROFESSOR
CODE       SLOT       START END_T CODE       ID         ROOM  SEM_C DAY_OF_WEE
---------- ---------- ----- ----- ---------- ---------- ----- ----- ----------
CL001      MOR        09:00 09:00 C0001      P0001      A114  Win01 Monday
CL002      AFT        13:00 13:00 C0002      P0002      B201  Win02 Tuesday
CL003      EVE        17:00 17:00 C0003      P0003      C301  Win01 Wednesday
CL004      MOR        09:00 09:00 C0004      P0004      D401  Fall1 Thursday
CL005      AFT        13:00 13:00 C0005      P0005      E501  Fall1 Friday
CL006      EVE        17:00 17:00 C0007      P0006      F609  Fall2 Tuesday
CL007      AFT        13:00 13:00 C0008      P0005      E502  Fall2 Saturday
CL008      EVE        17:00 17:00 C0007      P0006      F609  Win01 Tuesday
```

SEMESTER



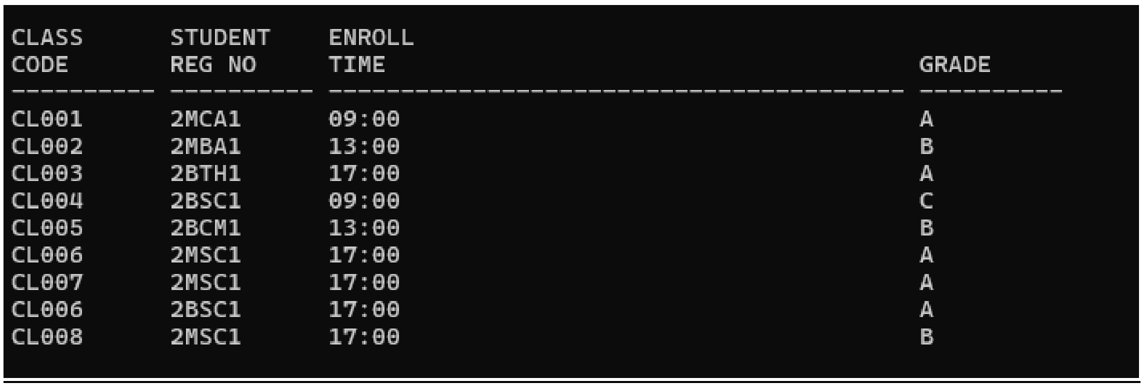
```
SQL> Select * from SEMESTER;

                  START     END
SEM_C TERM   YEAR DATE      DATE
----- ------ ---- --------- ---------
Win01 Winter 2016 01-NOV-16 15-APR-17
Fall1 Fall   2016 01-MAR-16 15-NOV-16
Win02 Winter 2017 01-NOV-17 15-APR-18
Fall2 Fall   2017 01-MAR-17 15-NOV-17
```

STUDENT



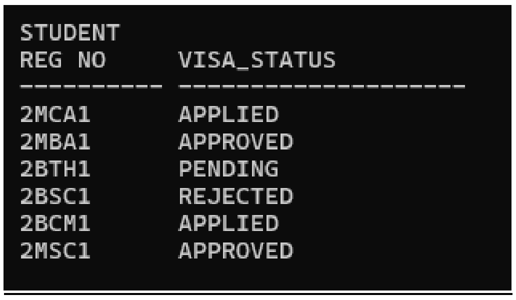
```
STUDENT    STUDENT              STUDENT                                  STUDENT                         DEPARTMENT PROFESSOR
REG NO     NAME                 ADDRESS                        DOB       EMAIL                MOBILE     ID         ID
---------- -------------------- ------------------------------ --------- -------------------- ---------- ---------- ----------
2MCA1      Barshaa              Asansol                        15-DEC-02 barsha7@gmail.com    9749806802 D0001      P0001
2MBA1      Rahul                Mumbai                         20-JAN-01 rahul123@gmail.com   9876543210 D0003      P0003
2BTH1      Sneha                Delhi                          05-MAR-00 sneha456@gmail.com   9123456780 D0002      P0002
2BSC1      Amit                 Kolkata                        10-JUL-02 amit789@gmail.com    9988776655 D0005      P0005
2BCM1      Priya                Chennai                        25-SEP-01 priya101@gmail.com   9871234567 D0004      P0004
2MSC1      Vikram               Bangalore                      15-NOV-00 vikram202@gmail.com  9765432109 D0001      P0007
2BBA1      Aadi                 Katpadi                        15-NOV-00 aadi202@gmail.com    9765432009 D0002      P0006
2BCA1      Ayul                 Katpadi                        15-NOV-19 ayu202@gmail.com     9765482009 D0003      P0006
```

<u>ENROLL</u>



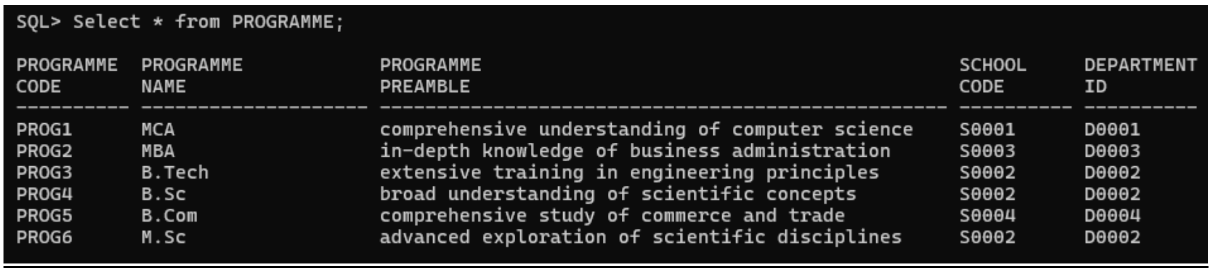
```
CLASS      STUDENT    ENROLL
CODE       REG NO     TIME                                     GRADE
---------- ---------- ---------------------------------------- ----------
CL001      2MCA1      09:00                                    A
CL002      2MBA1      13:00                                    B
CL003      2BTH1      17:00                                    A
CL004      2BSC1      09:00                                    C
CL005      2BCM1      13:00                                    B
CL006      2MSC1      17:00                                    A
CL007      2MSC1      17:00                                    A
CL006      2BSC1      17:00                                    A
CL008      2MSC1      17:00                                    B
```

<u>STUDENT VISA</u>



```
STUDENT
REG NO     VISA_STATUS
---------- --------------------
2MCA1      APPLIED
2MBA1      APPROVED
2BTH1      PENDING
2BSC1      REJECTED
2BCM1      APPLIED
2MSC1      APPROVED
```

<u>PROGRAMME</u>



```
SQL> Select * from PROGRAMME;

PROGRAMME  PROGRAMME            PROGRAMME                                          SCHOOL     DEPARTMENT
CODE       NAME                 PREAMBLE                                           CODE       ID
---------- -------------------- -------------------------------------------------- ---------- ----------
PROG1      MCA                  comprehensive understanding of computer science    S0001      D0001
PROG2      MBA                  in-depth knowledge of business administration      S0003      D0003
PROG3      B.Tech               extensive training in engineering principles       S0002      D0002
PROG4      B.Sc                 broad understanding of scientific concepts         S0002      D0002
PROG5      B.Com                comprehensive study of commerce and trade          S0004      D0004
PROG6      M.Sc                 advanced exploration of scientific disciplines     S0002      D0002
```

3. **Alter or Recreate the above tables with primary key and foreign key and the following integrity constraints assigning name to integrity constrain**

SOLUTION

```
--PRIMARY KEYS

ALTER TABLE PROFESSOR ADD CONSTRAINT pk_professor PRIMARY KEY (Prof_id);

ALTER TABLE SCHOOL ADD CONSTRAINT pk_school PRIMARY KEY (SCode);

ALTER TABLE DEPARTMENT ADD CONSTRAINT pk_department PRIMARY KEY (Dept_id);

ALTER TABLE COURSE ADD CONSTRAINT pk_course PRIMARY KEY (Crs_code);

ALTER TABLE CLASS ADD CONSTRAINT pk_class PRIMARY KEY (Cls_code);

ALTER TABLE SEMESTER ADD CONSTRAINT pk_semester PRIMARY KEY (Sem_code);

ALTER TABLE STUDENT ADD CONSTRAINT pk_student PRIMARY KEY (Reg_no);

ALTER TABLE ENROLL ADD CONSTRAINT pk_enroll PRIMARY KEY (Cls_code, Reg_no);

ALTER TABLE STUDENT_VISA ADD CONSTRAINT pk_student_visa PRIMARY KEY (Reg_no);

ALTER TABLE PROGRAMME ADD CONSTRAINT pk_programme PRIMARY KEY (Prog_code);


--Add FK

alter table PROFESSOR add constraint fk_Dept foreign key(Dept_id) references DEPARTMENT(Dept_id)
deferrable initially deferred;

alter table SCHOOL add constraint fk_Prof_id foreign key(Prof_id) references PROFESSOR(Prof_id) deferrable
initially deferred;

alter table DEPARTMENT add constraint fk_Profid foreign key(Prof_id) references PROFESSOR(Prof_id)
deferrable initially deferred;

alter table DEPARTMENT add constraint fk_SCode foreign key(SCode) references SCHOOL(SCode) deferrable
initially deferred;

alter table CLASS add constraint fk_Crs_code foreign key(Crs_code) references COURSE(Crs_code) deferrable
initially deferred;

alter table CLASS add constraint fk_Prfid foreign key(Prof_id) references PROFESSOR (Prof_id) deferrable
initially deferred;

alter table CLASS add constraint fk_SemCode foreign key(Sem_code) references Semester(Sem_code)
deferrable initially deferred;

alter table STUDENT add constraint fk_Depid foreign key(Dept_id) references DEPARTMENT (Dept_id)
deferrable initially deferred;

alter table STUDENT add constraint fk_Proid foreign key(Prof_id) references PROFESSOR (Prof_id) deferrable
initially deferred;

alter table Enroll add constraint fk_ClsCode foreign key(Cls_code) references CLASS (Cls_code) deferrable
initially deferred;
```

alter table Enroll add constraint fk_RegNo foreign key(Reg_no) references STUDENT (Reg_no) deferrable initially deferred;

alter table PROGRAMME add constraint fk_SC foreign key(Scode) references SCHOOL (SCode) deferrable initially deferred;

alter table PROGRAMME add constraint fk_DepI foreign key(Dept_id) references DEPARTMENT (Dept_id) deferrable initially deferred;

4. **i) Prof_id must have exactly five characters and their email and mobile number are unique. The email address must have @ as one of the characters and mobile number must have exactly ten characters.**
   ii) Use timestamp data type without fractional parts of seconds for start time and end time column of class table
   iii) The Sem_code should start with either 'Win' or 'Fall' and Term column can assume only one of two values {Winter, Fall}.
   iv) Email and mobile column in student table should have same characteristics as those in professor table.
   v) The enroll_time in the enroll table should be of timestamp data type without fractional parts of seconds. The grade may assume one of the values in {'S', 'A', 'B', 'C', 'D'}
   vi) Use 'on delete cascade' or 'on delete set null' clause as requirements. Use deferrable constraint, if required.
   vii) Additional (innovative) integrity constraints, if any, may be specified by you.

```
--PROFESSOR
alter table PROFESSOR add constraint uk_email unique(Email);
alter table PROFESSOR add constraint uk_Mobile unique(Mobile);
alter table PROFESSOR add constraint chk_Len CHECK(LENGTH(Prof_id)=5);
alter table PROFESSOR add constraint chk_Len_Mob CHECK(LENGTH(Mobile)=10);
alter table PROFESSOR add constraint chk_Email_atTheRate CHECK(Email like '%@%');

--SEMESTER
alter table SEMESTER add constraint chk_SemesCod CHECK(sem_code Like 'Win%' or sem_code like
'Fall%' );
alter table SEMESTER add constraint chk_Term CHECK(Term IN ('Winter', 'Fall') );

--STUDENT
alter table STUDENT add constraint uk_stu_email unique(Email);
alter table STUDENT add constraint uk_stu_Mobile unique(Mobile);
alter table STUDENT add constraint chk_Len_StuMob CHECK(LENGTH(Mobile)=10);
alter table STUDENT add constraint chk_stuEmail_atTheRate CHECK(Email like '%@%');

--ENROLL
alter table Enroll add constraint chk_value CHECK(Grade IN ('S', 'A','B','C','D'));
```

4. . In built functions

(i) Test the string manipulation functions – UPPER, LOWER, INITCAP, LENGTH, LPAD, RPAD, LTRIM, RTRIM and TRIM, using select queries on data present in the tables. Use one query each for demonstration of one function

SELECT UPPER(Sname) FROM STUDENT;

SELECT LOWER(Sname) FROM STUDENT;

SELECT INITCAP(Visa_status) FROM STUDENT_VISA;

SELECT LENGTH(Dname) FROM DEPARTMENT;

SELECT LPAD(Visa_status,12,'*') FROM STUDENT_VISA;

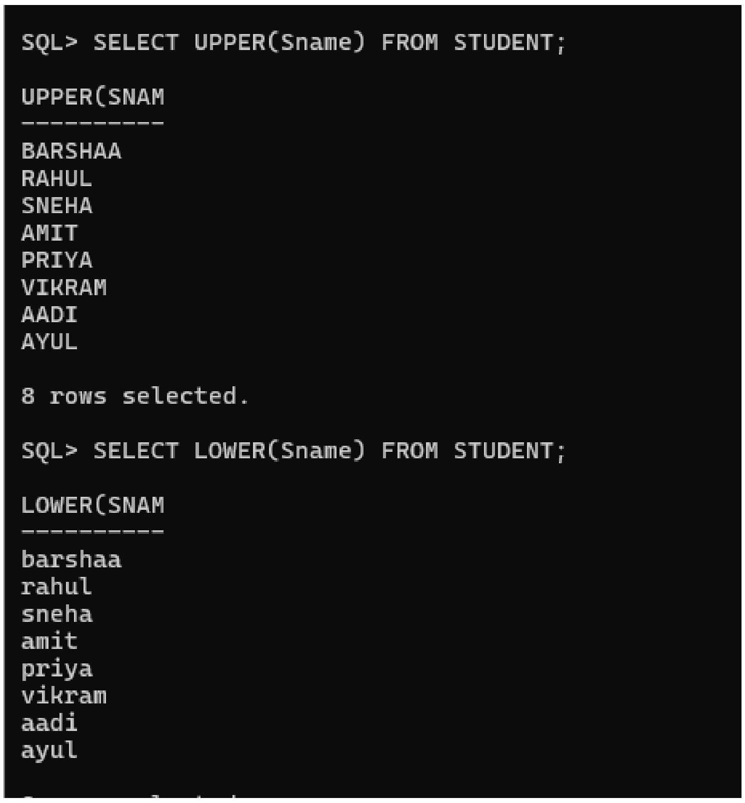
SELECT RPAD(Visa_status,12,'*') FROM STUDENT_VISA;

SELECT TRIM(emp_name) FROM Emp1;

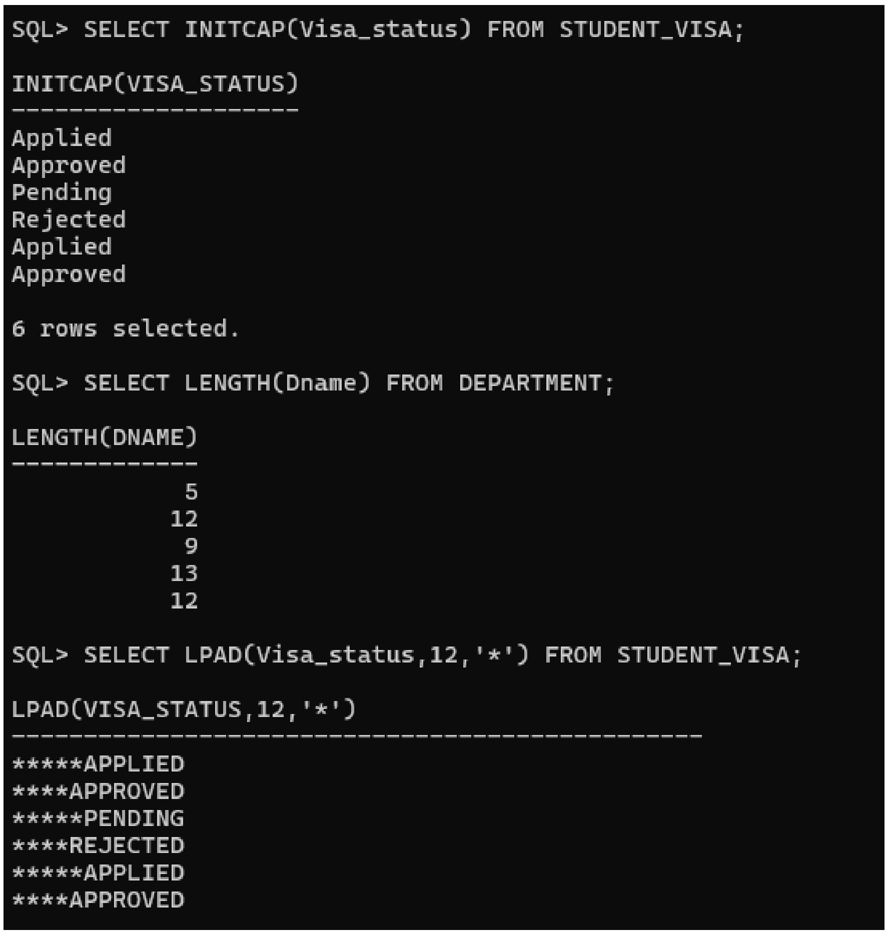
SELECT RTRIM(emp_name,' ') FROM Emp1;

SELECT LTRIM(emp_name, ' ') FROM Emp1;

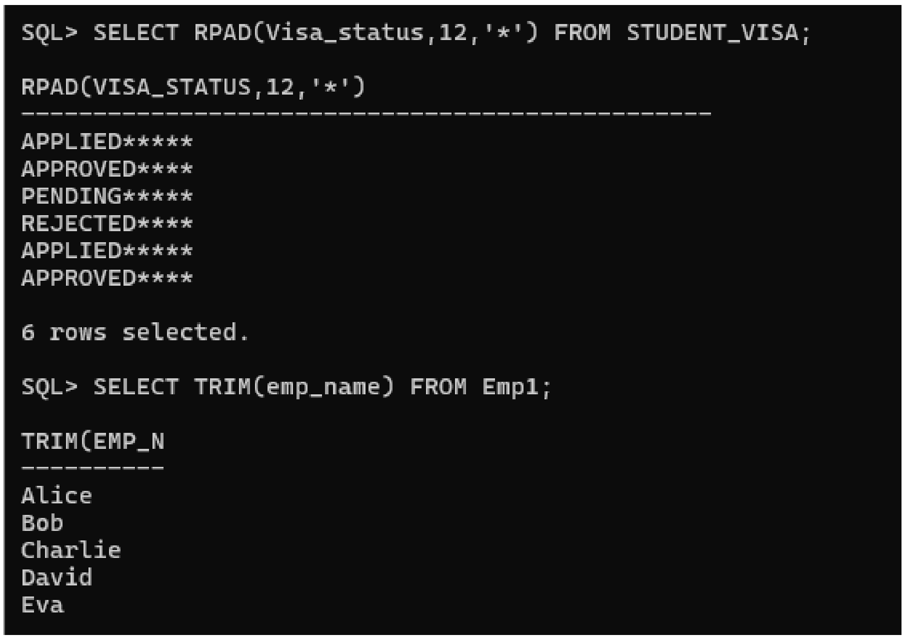
<u>SOLUTION</u>



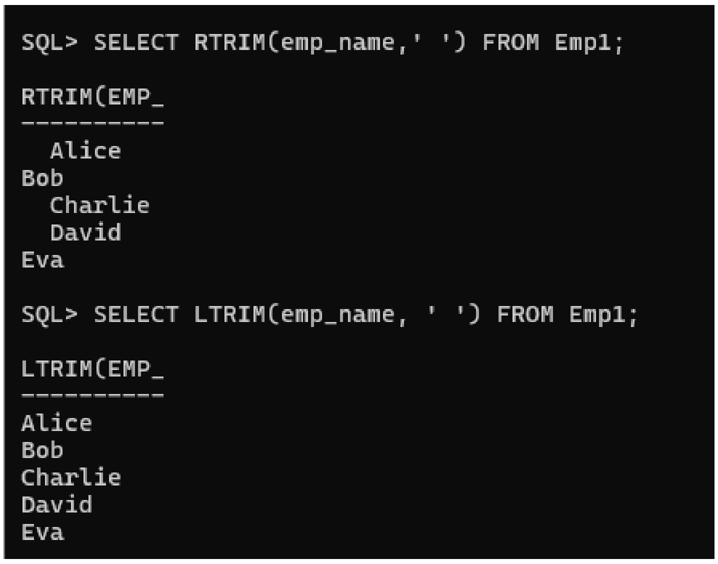
```
SQL> SELECT UPPER(Sname) FROM STUDENT;

UPPER(SNAM
----------
BARSHAA
RAHUL
SNEHA
AMIT
PRIYA
VIKRAM
AADI
AYUL

8 rows selected.

SQL> SELECT LOWER(Sname) FROM STUDENT;

LOWER(SNAM
----------
barshaa
rahul
sneha
amit
priya
vikram
aadi
ayul
```



```
SQL> SELECT INITCAP(Visa_status) FROM STUDENT_VISA;

INITCAP(VISA_STATUS)
--------------------
Applied
Approved
Pending
Rejected
Applied
Approved

6 rows selected.

SQL> SELECT LENGTH(Dname) FROM DEPARTMENT;

LENGTH(DNAME)
-------------
            5
           12
            9
           13
           12

SQL> SELECT LPAD(Visa_status,12,'*') FROM STUDENT_VISA;

LPAD(VISA_STATUS,12,'*')
------------------------------------------------
*****APPLIED
****APPROVED
*****PENDING
****REJECTED
*****APPLIED
****APPROVED
```



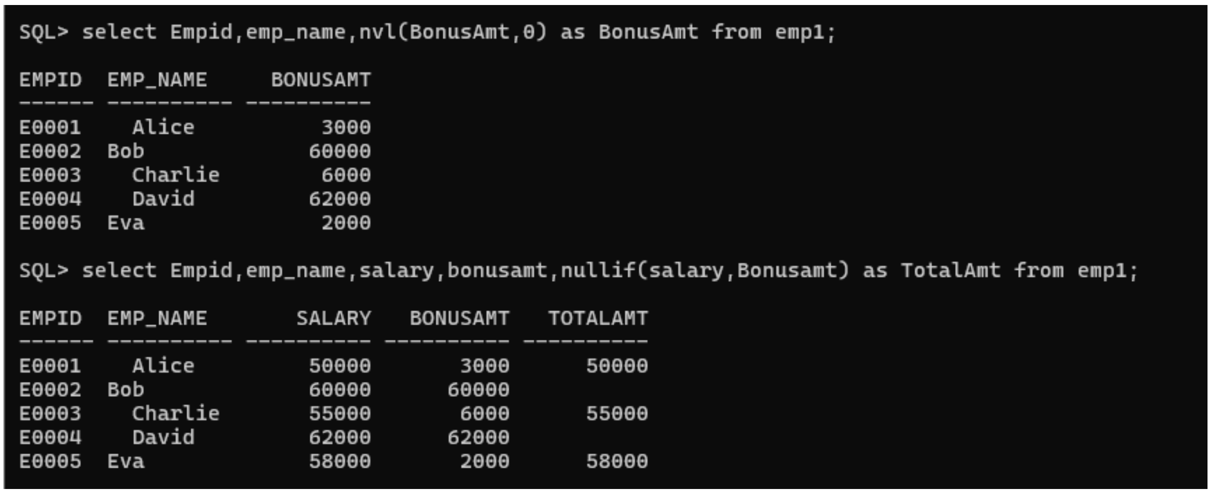
```
SQL> SELECT RPAD(Visa_status,12,'*') FROM STUDENT_VISA;

RPAD(VISA_STATUS,12,'*')
------------------------------------------------
APPLIED*****
APPROVED****
PENDING*****
REJECTED****
APPLIED*****
APPROVED****

6 rows selected.

SQL> SELECT TRIM(emp_name) FROM Emp1;

TRIM(EMP_N
----------
Alice
Bob
Charlie
David
Eva
```


```
SQL> SELECT RTRIM(emp_name,' ') FROM Emp1;

RTRIM(EMP_
----------
  Alice
Bob
  Charlie
  David
Eva

SQL> SELECT LTRIM(emp_name, ' ') FROM Emp1;

LTRIM(EMP_
----------
Alice
Bob
Charlie
David
Eva
```

(ii) Write query to illustrate usage of NVL function and NULLIF function.

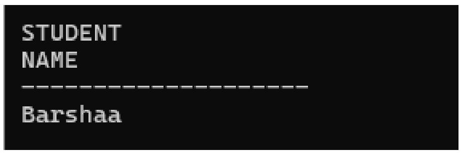
select Empid,emp_name,nvl(BonusAmt,0) as BonusAmt from emp1;

select Empid,emp_name,salary,bonusamt,nullif(salary,Bonusamt) as TotalAmt from emp1; --not returning null when not equal


```
SQL> select Empid,emp_name,nvl(BonusAmt,0) as BonusAmt from emp1;

EMPID  EMP_NAME     BONUSAMT
------ ---------- ----------
E0001    Alice          3000
E0002  Bob             60000
E0003    Charlie        6000
E0004    David         62000
E0005  Eva              2000

SQL> select Empid,emp_name,salary,bonusamt,nullif(salary,Bonusamt) as TotalAmt from emp1;

EMPID  EMP_NAME       SALARY   BONUSAMT   TOTALAMT
------ ---------- ---------- ---------- ----------
E0001    Alice         50000       3000      50000
E0002  Bob             60000      60000
E0003    Charlie       55000       6000      55000
E0004    David         62000      62000
E0005  Eva             58000       2000      58000
```

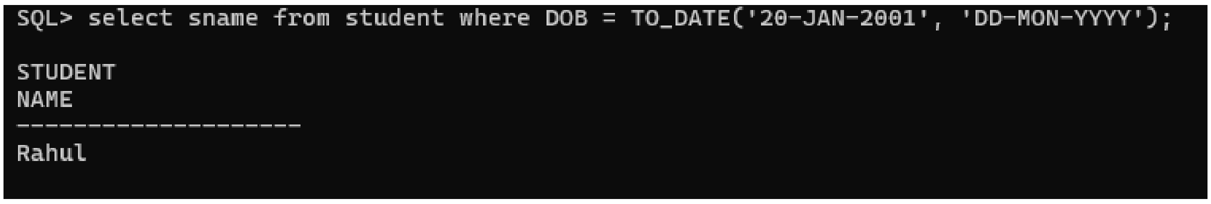
(iii) Display the name of the students who were born on a specified month.

select sname from student where extract(month from DOB)=12;


```
STUDENT
NAME
--------------------
Barshaa
```

(iv) Display the name of the students with a specified date of birth.

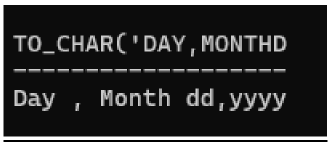
select sname from student where DOB = TO_DATE('20-JAN-2001', 'DD-MON-YYYY');



```
SQL> select sname from student where DOB = TO_DATE('20-JAN-2001', 'DD-MON-YYYY');

STUDENT
NAME
--------------------
Rahul
```

(v) Display the date of birth of a specified student in the format 'Day of week, Month dd, yyyy'.

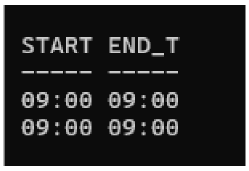
select TO_CHAR('Day , Month dd,yyyy') from student where sname='Barshaa';



```
TO_CHAR('DAY,MONTHD
-------------------
Day , Month dd,yyyy
```

(vi) Display the hour and minutes of the start time and end time of a specified slot.

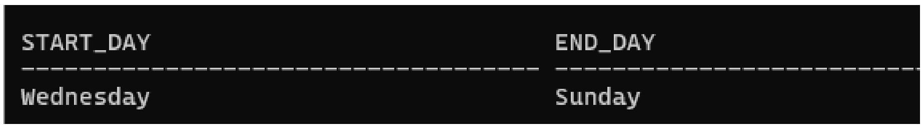
SELECT TO_CHAR(Stime, 'HH24:MI') AS Start_Time, TO_CHAR(Etime, 'HH24:MI') AS End_Time FROM CLASS WHERE Slot = 'MOR';



```
START END_T
----- -----
09:00 09:00
09:00 09:00
```

(vii) Display the day of week of the start date and end date of Winter semester 17–18.

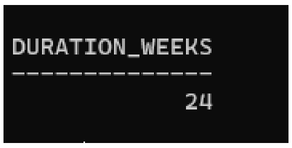
```
SELECT
  TO_CHAR(Sdate, 'Day') AS Start_Day,
  TO_CHAR(Edate, 'Day') AS End_Day
FROM SEMESTER
WHERE Term = 'Winter'
 AND Year = '2017';
```



```
START_DAY                            END_DAY
------------------------------------ --------------------------
Wednesday                            Sunday
```

(viii) Display the duration of Winter semester 17–18 in terms of number of weeks.

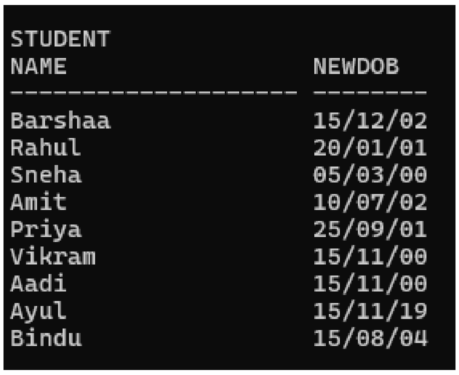
SELECT ROUND((Edate - Sdate) / 7) AS Duration_Weeks FROM SEMESTER WHERE Term = 'Winter' AND Year = '2017';



```
DURATION_WEEKS
--------------
            24
```

(ix) Store date in the format dd/mm/yy for DOB of newly admitted student.

SELECT sname, TO_CHAR(DOB, 'DD/MM/YY') AS NewDob FROM student;



```
STUDENT
NAME                 NEWDOB
-------------------- --------
Barshaa              15/12/02
Rahul                20/01/01
Sneha                05/03/00
Amit                 10/07/02
Priya                25/09/01
Vikram               15/11/00
Aadi                 15/11/00
Ayul                 15/11/19
Bindu                15/08/04
```

(x) Test the numeric functions – CEIL, FLOOR, TRUCATE, MIN, MAX, AVG,COUNT using select queries on data present in the tables. Use one query each for demonstration of one function.

SELECT CEIL(AVG(Credits)) FROM COURSE;

SELECT FLOOR(AVG(Credits)) FROM COURSE;

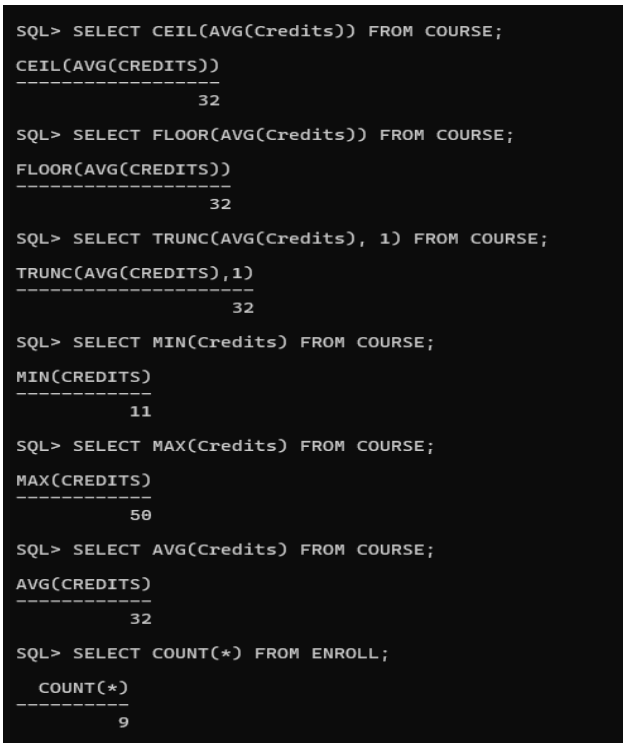
SELECT TRUNC(AVG(Credits), 1) FROM COURSE;

SELECT MIN(Credits) FROM COURSE;

SELECT MAX(Credits) FROM COURSE;

SELECT AVG(Credits) FROM COURSE;

SELECT COUNT(*) FROM ENROLL;

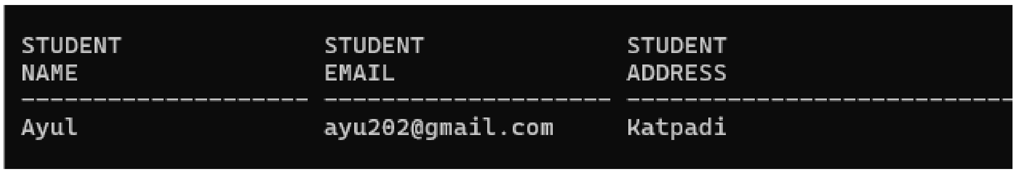


```
SQL> SELECT CEIL(AVG(Credits)) FROM COURSE;

CEIL(AVG(CREDITS))
------------------
                32

SQL> SELECT FLOOR(AVG(Credits)) FROM COURSE;

FLOOR(AVG(CREDITS))
-------------------
                 32

SQL> SELECT TRUNC(AVG(Credits), 1) FROM COURSE;

TRUNC(AVG(CREDITS),1)
---------------------
                   32

SQL> SELECT MIN(Credits) FROM COURSE;

MIN(CREDITS)
------------
          11

SQL> SELECT MAX(Credits) FROM COURSE;

MAX(CREDITS)
------------
          50

SQL> SELECT AVG(Credits) FROM COURSE;

AVG(CREDITS)
------------
          32

SQL> SELECT COUNT(*) FROM ENROLL;

  COUNT(*)
----------
         9
```

5. **<u>Write Queries for</u>**

i. **<u>Display name, email address and address for those students who live in Katpadi area and whose name has an l as the third character.</u>**

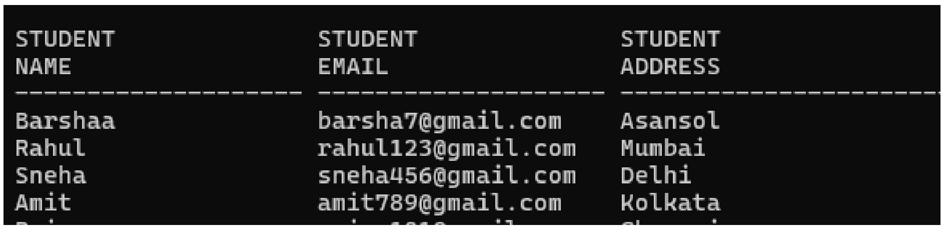
SELECT sname, Email, Address FROM Student WHERE Address = 'Katpadi' AND sname LIKE '___l%';



```
STUDENT              STUDENT              STUDENT
NAME                 EMAIL                ADDRESS
-------------------- -------------------- ---------------------------
Ayul                 ayu202@gmail.com     Katpadi
```

ii. **<u>Display name, email address and address for those students who are not from Tamil Nadu.</u>**

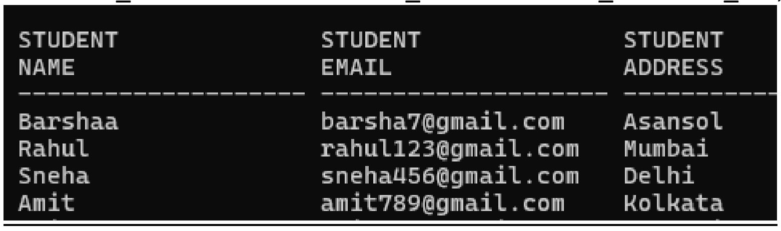
SELECT sname, Email, Address FROM Student WHERE Address != 'Tamil Nadu';



```
STUDENT              STUDENT              STUDENT
NAME                 EMAIL                ADDRESS
-------------------- -------------------- ----------------------
Barshaa              barsha7@gmail.com    Asansol
Rahul                rahul123@gmail.com   Mumbai
Sneha                sneha456@gmail.com   Delhi
Amit                 amit789@gmail.com    Kolkata
```

iii. **<u>Display name, email address and address of foreign students only.</u>**

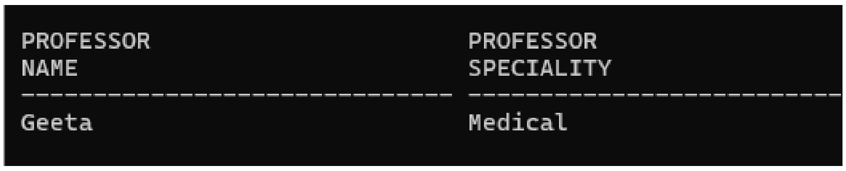
SELECT STUDENT.SNAME, STUDENT.EMAIL,STUDENT.ADDRESS FROM STUDENT INNER JOIN STUDENT_VISA ON STUDENT.REG_NO = STUDENT_VISA.REG_NO;



```
STUDENT              STUDENT              STUDENT
NAME                 EMAIL                ADDRESS
-------------------- -------------------- ----------
Barshaa              barsha7@gmail.com    Asansol
Rahul                rahul123@gmail.com   Mumbai
Sneha                sneha456@gmail.com   Delhi
Amit                 amit789@gmail.com    Kolkata
```

<u>(iv) List the name of professors along with their specialty who belong to School of Medicine.</u>

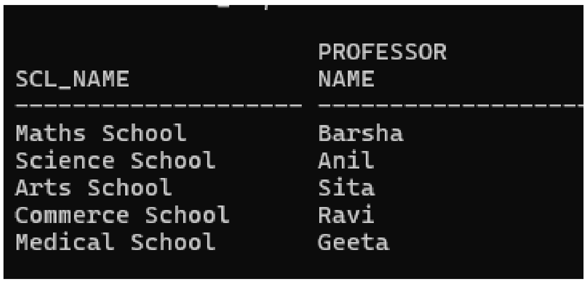
SELECT PROFESSOR.PROF_NAME, PROFESSOR.SPECIALITY FROM PROFESSOR INNER JOIN SCHOOL ON SCHOOL.SCL_NAME = 'Medical School' AND SCHOOL.PROF_ID = PROFESSOR.PROF_ID;



```
PROFESSOR                      PROFESSOR
NAME                           SPECIALITY
------------------------------ -------------------------
Geeta                          Medical
```

<u>v.Display name of the school and name of professor who chairs the school.</u>

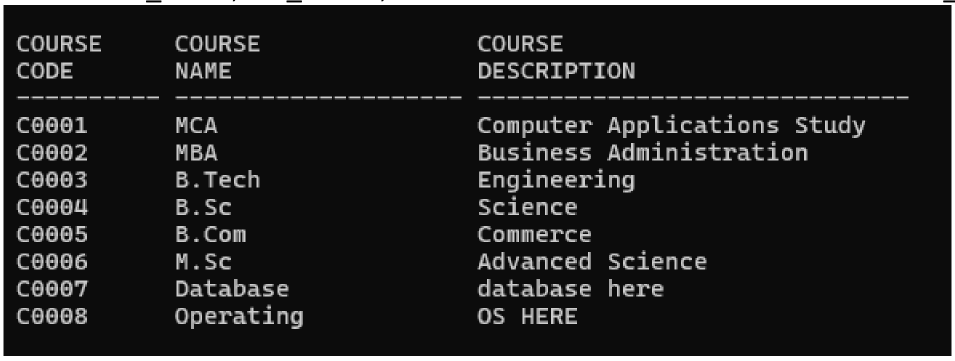
SELECT SCHOOL.SCL_NAME, PROFESSOR.PROF_NAME FROM PROFESSOR INNER JOIN SCHOOL ON SCHOOL.PROF_ID = PROFESSOR.PROF_ID;



```
                     PROFESSOR
SCL_NAME             NAME
-------------------- -------------------
Maths School         Barsha
Science School       Anil
Arts School          Sita
Commerce School      Ravi
Medical School       Geeta
```

vi. **List course code, course name and course description in alphabetic order of course code.**

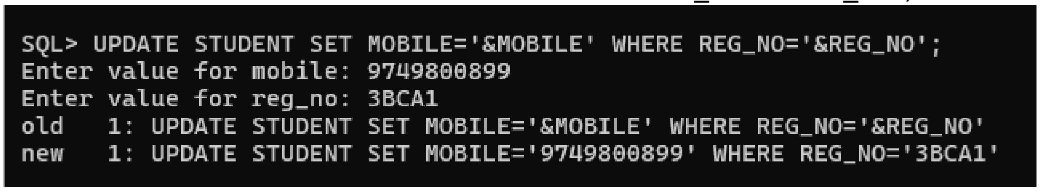
SELECT CRS_CODE,CRS_NAME, DESCRIPTION FROM COURSE ORDER BY CRS_CODE;



```
COURSE     COURSE               COURSE
CODE       NAME                 DESCRIPTION
---------- -------------------- ------------------------------
C0001      MCA                  Computer Applications Study
C0002      MBA                  Business Administration
C0003      B.Tech               Engineering
C0004      B.Sc                 Science
C0005      B.Com                Commerce
C0006      M.Sc                 Advanced Science
C0007      Database             database here
C0008      Operating            OS HERE
```

vii. **Change the mobile number of a student interactively.**

UPDATE STUDENT SET MOBILE='&MOBILE' WHERE REG_NO='&REG_NO';



```
SQL> UPDATE STUDENT SET MOBILE='&MOBILE' WHERE REG_NO='&REG_NO';
Enter value for mobile: 9749800899
Enter value for reg_no: 3BCA1
old   1: UPDATE STUDENT SET MOBILE='&MOBILE' WHERE REG_NO='&REG_NO'
new   1: UPDATE STUDENT SET MOBILE='9749800899' WHERE REG_NO='3BCA1'
```

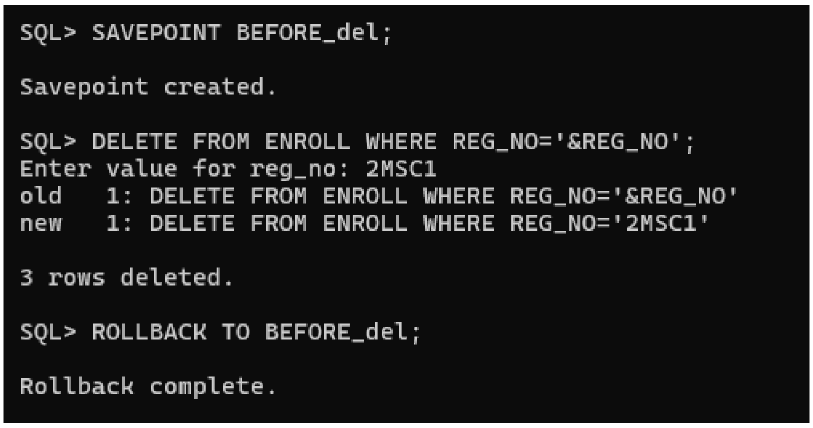
(viii) Remove enrollment information of a student from a particular course interactively. How would you recover the data?

SAVEPOINT BEFORE_del;

DELETE FROM ENROLL WHERE REG_NO='&REG_NO';

--we can recover data with the help of ROLLBACK

ROLLBACK TO BEFORE_del;

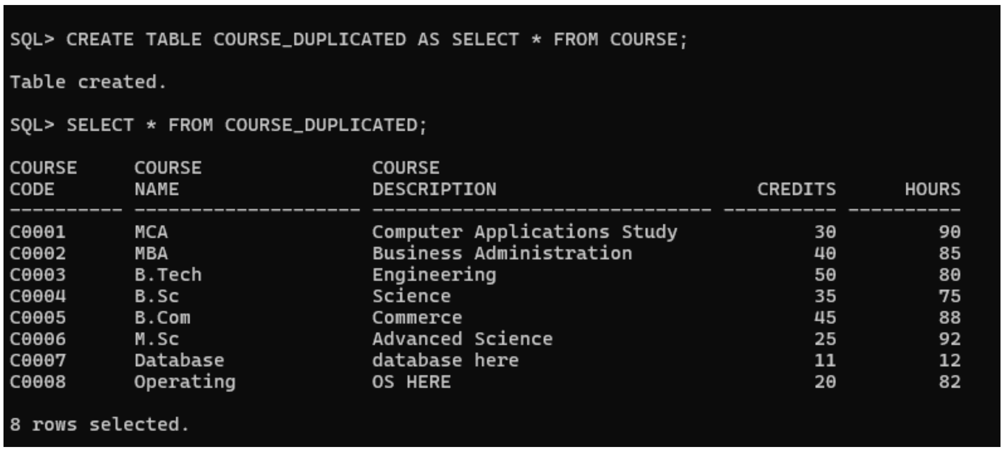


```
SQL> SAVEPOINT BEFORE_del;

Savepoint created.

SQL> DELETE FROM ENROLL WHERE REG_NO='&REG_NO';
Enter value for reg_no: 2MSC1
old   1: DELETE FROM ENROLL WHERE REG_NO='&REG_NO'
new   1: DELETE FROM ENROLL WHERE REG_NO='2MSC1'

3 rows deleted.

SQL> ROLLBACK TO BEFORE_del;

Rollback complete.
```

(ix) Create a duplicate of course table.

CREATE TABLE COURSE_DUPLICATED AS SELECT * FROM COURSE;

SELECT * FROM COURSE_DUPLICATED;



```
SQL> CREATE TABLE COURSE_DUPLICATED AS SELECT * FROM COURSE;

Table created.

SQL> SELECT * FROM COURSE_DUPLICATED;

COURSE     COURSE               COURSE
CODE       NAME                 DESCRIPTION                       CREDITS      HOURS
---------- -------------------- ------------------------------ ---------- ----------
C0001      MCA                  Computer Applications Study            30         90
C0002      MBA                  Business Administration                40         85
C0003      B.Tech               Engineering                            50         80
C0004      B.Sc                 Science                                35         75
C0005      B.Com                Commerce                               45         88
C0006      M.Sc                 Advanced Science                       25         92
C0007      Database             database here                          11         12
C0008      Operating            OS HERE                                20         82

8 rows selected.
```

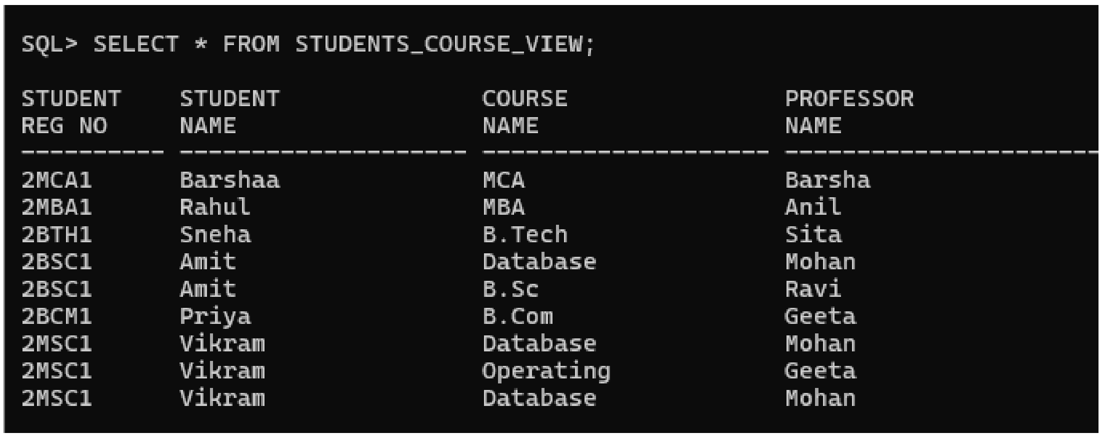
(x) Create a view for list of students (Reg_no, Sname) and the courses they have registered along with name of professors teaching the course.

CREATE VIEW STUDENTS_COURSE_VIEW AS

SELECT STUDENT.REG_NO, STUDENT.SNAME, COURSE.CRS_NAME, PROFESSOR.PROF_NAME FROM STUDENT INNER JOIN ENROLL ON ENROLL.REG_NO = STUDENT.REG_NO INNER JOIN CLASS ON ENROLL.CLS_CODE = CLASS.CLS_CODE INNER JOIN COURSE ON COURSE.CRS_CODE = CLASS.CRS_CODE

INNER JOIN PROFESSOR ON PROFESSOR.PROF_ID = CLASS.PROF_ID;

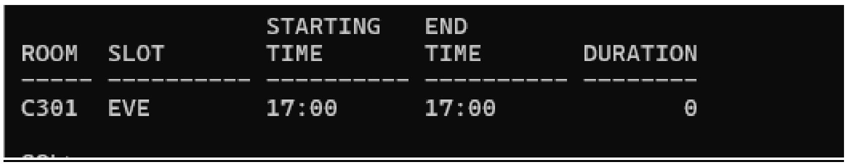
SELECT * FROM STUDENTS_COURSE_VIEW;



```
SQL> SELECT * FROM STUDENTS_COURSE_VIEW;

STUDENT    STUDENT              COURSE               PROFESSOR
REG NO     NAME                 NAME                 NAME
---------- -------------------- -------------------- ----------------------
2MCA1      Barshaa              MCA                  Barsha
2MBA1      Rahul                MBA                  Anil
2BTH1      Sneha                B.Tech               Sita
2BSC1      Amit                 Database             Mohan
2BSC1      Amit                 B.Sc                 Ravi
2BCM1      Priya                B.Com                Geeta
2MSC1      Vikram               Database             Mohan
2MSC1      Vikram               Operating            Geeta
2MSC1      Vikram               Database             Mohan
```

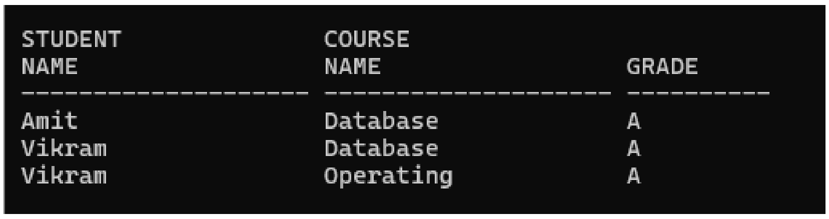
(xi) List the room number, slot, start time, end time and duration of every class held on Wednesdays in descending order of room number.

SELECT ROOM_NO, SLOT, TO_CHAR(Stime, 'HH24:MI') AS STIME, TO_CHAR(Etime, 'HH24:MI') AS ETIME, EXTRACT (HOUR FROM ETIME - STIME) AS "DURATION" FROM CLASS WHERE DAY_OF_WEEK = 'Wednesday' ORDER BY ROOM_NO DESC;


```
                    STARTING   END
ROOM  SLOT          TIME       TIME       DURATION
----- ---------- ---------- ---------- --------
C301  EVE           17:00      17:00            0
```

(xii) Display the name and grade of a student in different courses underwent in fall semester 2017 – 18.

SELECT STUDENT.SNAME, COURSE.CRS_NAME, ENROLL.GRADE FROM STUDENT INNER JOIN ENROLL ON ENROLL.REG_NO = STUDENT.REG_NO INNER JOIN CLASS ON CLASS.CLS_CODE = ENROLL.CLS_CODE INNER JOIN COURSE ON COURSE.CRS_CODE = CLASS.CRS_CODE INNER JOIN SEMESTER ON SEMESTER.SEM_CODE = CLASS.SEM_CODE AND SEMESTER.TERM = 'Fall' AND SEMESTER.YEAR = 2017;


```
STUDENT              COURSE
NAME                 NAME                 GRADE
-------------------- -------------------- ----------
Amit                 Database             A
Vikram               Database             A
Vikram               Operating            A
```

(xiii) Find out name of students who have taken Database Systems course as well as Operating Systems course in fall semester 2016 – 17.

SELECT STUDENT.SNAME FROM STUDENT INNER JOIN ENROLL

ON ENROLL.REG_NO = STUDENT.REG_NO INNER JOIN CLASS

ON CLASS.CLS_CODE = ENROLL.CLS_CODE

INNER JOIN COURSE

ON CLASS.CRS_CODE = COURSE.CRS_CODE

AND COURSE.CRS_CODE IN ('C0007',

'C0008')

INNER JOIN SEMESTER

ON SEMESTER.SEM_CODE = CLASS.SEM_CODE

AND SEMESTER.TERM = 'Fall'

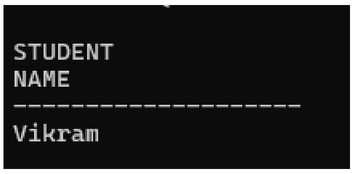
AND SEMESTER.YEAR = 2017

GROUP BY

STUDENT.SNAME

HAVING

COUNT(DISTINCT COURSE.CRS_CODE) = 2;


```
STUDENT
NAME
--------------------
Vikram
```

(xiv) Find out name of students who have taken Database Systems course but have not taken Operating Systems course in winter semester 2017 – 18.

SELECT STUDENT.SNAME, COURSE.CRS_CODE FROM STUDENT

INNER JOIN ENROLL ON ENROLL.REG_NO = STUDENT.REG_NO

INNER JOIN CLASS ON ENROLL.CLS_CODE = CLASS.CLS_CODE

INNER JOIN COURSE ON COURSE.CRS_CODE = CLASS.CRS_CODE AND COURSE.CRS_CODE IN ('C0007','C0008')

INNER JOIN SEMESTER ON SEMESTER.SEM_CODE = CLASS.SEM_CODE AND SEMESTER.YEAR = 2017

AND SEMESTER.TERM = 'Winter'

MINUS

SELECT STUDENT.SNAME, COURSE.CRS_CODE FROM STUDENT

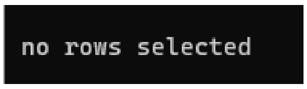
INNER JOIN ENROLL ON ENROLL.REG_NO = STUDENT.REG_NO

INNER JOIN CLASS ON ENROLL.CLS_CODE = CLASS.CLS_CODE

INNER JOIN COURSE ON COURSE.CRS_CODE = CLASS.CRS_CODE

AND COURSE.CRS_CODE = 'C0008' INNER JOIN SEMESTER ON SEMESTER.SEM_CODE = CLASS.SEM_CODE AND SEMESTER.YEAR = 2018

AND SEMESTER.TERM = 'Win01';



```
no rows selected
```

<u>(xv) List the registration number and name of the students who have registered for maximum number of credits in Winter 17-18 semester.</u>

SELECT S.Reg_no, S.Sname

FROM STUDENT S

JOIN ENROLL E ON S.Reg_no = E.Reg_no

JOIN CLASS C ON E.Cls_code = C.Cls_code

JOIN COURSE CR ON C.Crs_code = CR.Crs_code

JOIN SEMESTER SEM ON C.Sem_code = SEM.Sem_code

WHERE SEM.Term = 'Win01'

  AND SEM.Year = '2016'

GROUP BY S.Reg_no, S.Sname

HAVING SUM(CR.Credits) = (

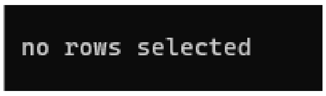
  SELECT MAX(Total_Credits)

  FROM (

    SELECT SUM(CR.Credits) AS Total_Credits

    FROM STUDENT S

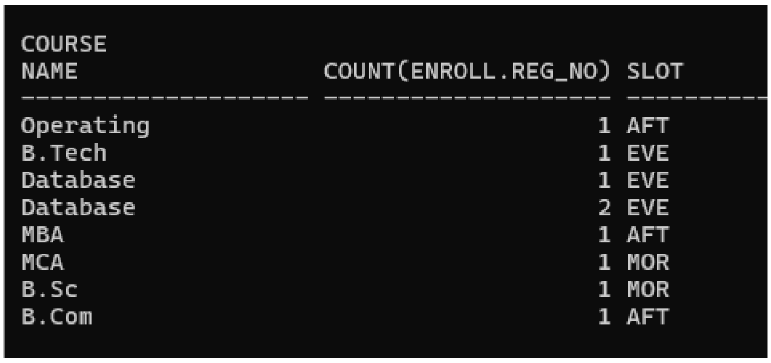
```
        JOIN ENROLL E ON S.Reg_no = E.Reg_no

        JOIN CLASS C ON E.Cls_code = C.Cls_code

        JOIN COURSE CR ON C.Crs_code = CR.Crs_code

        JOIN SEMESTER SEM ON C.Sem_code = SEM.Sem_code

        WHERE SEM.Term = 'Win01'

          AND SEM.Year = '2016'

        GROUP BY S.Reg_no

    )

);
```



```
no rows selected
```

(xvi) List the name of the course and the number of students registered in each slot for course under different faculty members.

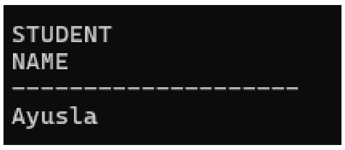
SELECT COURSE.CRS_NAME, COUNT(ENROLL.REG_NO), SLOT FROM COURSE, ENROLL, CLASS WHERE ENROLL.CLS_CODE = CLASS.CLS_CODE AND CLASS.CRS_CODE = COURSE.CRS_CODE GROUP BY ENROLL.REG_NO, COURSE.CRS_NAME, SLOT;



```
COURSE
NAME                 COUNT(ENROLL.REG_NO) SLOT
-------------------- -------------------- ----------
Operating                               1 AFT
B.Tech                                  1 EVE
Database                                1 EVE
Database                                2 EVE
MBA                                     1 AFT
MCA                                     1 MOR
B.Sc                                    1 MOR
B.Com                                   1 AFT
```

(xvii) Find out the name of the students who have registered in all the courses being taught by Prof. O’Brien in Winter 17-18.

SELECT STUDENT.SNAME FROM STUDENT, PROFESSOR, CLASS, ENROLL WHERE ENROLL.CLS_CODE = CLASS.CLS_CODE AND ENROLL.REG_NO = STUDENT.REG_NO AND CLASS.PROF_ID = PROFESSOR.PROF_ID AND PROFESSOR.PROF_NAME = 'O''Brien';



```
STUDENT
NAME
--------------------
Ayusla
```

(xviii) List the registration number of the students who registered in Database Systems course on November 17, 2017

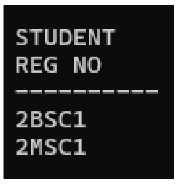
```
SELECT STUDENT.REG_NO

    FROM STUDENT, ENROLL, CLASS, COURSE

    WHERE ENROLL.REG_NO = STUDENT.REG_NO
```

AND ENROLL.CLS_CODE = CLASS.CLS_CODE

AND CLASS.CRS_CODE = COURSE.CRS_CODE

AND TO_CHAR(ENROLL.ENROLL_TIME, 'DD-MM-YYYY') = '17-11-2017'

AND COURSE.CRS_NAME = 'Database';



```
STUDENT
REG NO
----------
2BSC1
2MSC1
```

(xix) Write a query to display the grade of a student given his/her registration number and the course name for Fall semester 17–18.

SELECT ENROLL.REG_NO

FROM ENROLL, CLASS, SEMESTER

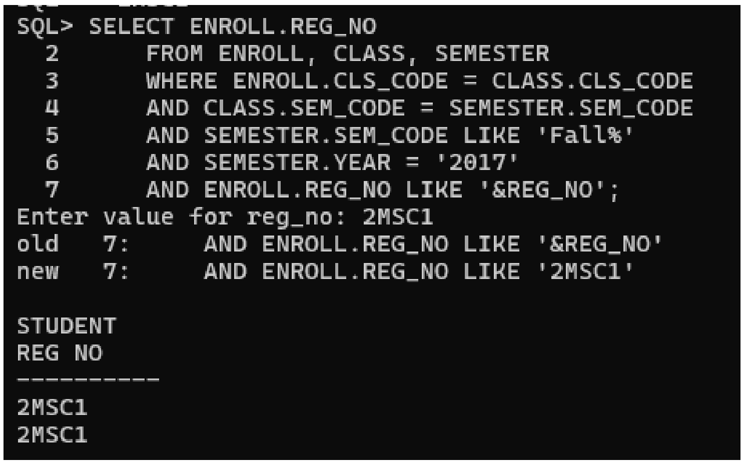
WHERE ENROLL.CLS_CODE = CLASS.CLS_CODE

AND CLASS.SEM_CODE = SEMESTER.SEM_CODE

AND SEMESTER.SEM_CODE LIKE 'Fall%'

AND SEMESTER.YEAR = '2017'

AND ENROLL.REG_NO LIKE '&REG_NO';



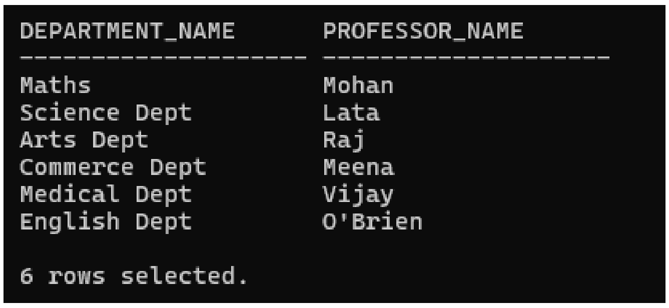
```
SQL> SELECT ENROLL.REG_NO
  2      FROM ENROLL, CLASS, SEMESTER
  3      WHERE ENROLL.CLS_CODE = CLASS.CLS_CODE
  4      AND CLASS.SEM_CODE = SEMESTER.SEM_CODE
  5      AND SEMESTER.SEM_CODE LIKE 'Fall%'
  6      AND SEMESTER.YEAR = '2017'
  7      AND ENROLL.REG_NO LIKE '&REG_NO';
Enter value for reg_no: 2MSC1
old   7:     AND ENROLL.REG_NO LIKE '&REG_NO'
new   7:     AND ENROLL.REG_NO LIKE '2MSC1'

STUDENT
REG NO
----------
2MSC1
2MSC1
```

(xx) List the name of departments and the name professors who is in charge of the department.

SELECT Dept.Dname AS Department_Name, Prof.Prof_name AS Professor_Name

FROM DEPARTMENT Dept

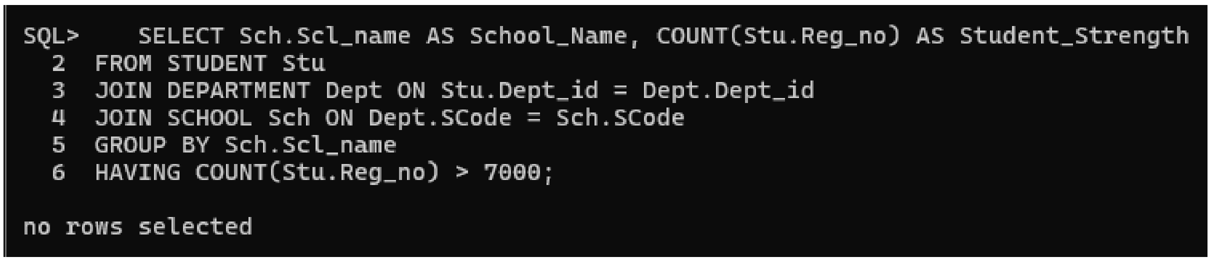
JOIN PROFESSOR Prof ON Dept.Prof_id = Prof.Prof_id;



```
DEPARTMENT_NAME      PROFESSOR_NAME
-------------------- --------------------
Maths                Mohan
Science Dept         Lata
Arts Dept            Raj
Commerce Dept        Meena
Medical Dept         Vijay
English Dept         O'Brien

6 rows selected.
```

(xxi) List the name of schools with students' strength higher than 7000.

SELECT Sch.Scl_name AS School_Name, COUNT(Stu.Reg_no) AS Student_Strength FROM STUDENT Stu JOIN DEPARTMENT Dept ON Stu.Dept_id = Dept.Dept_id JOIN SCHOOL Sch ON Dept.SCode = Sch.SCode GROUP BY Sch.Scl_name HAVING COUNT(Stu.Reg_no) > 7000;



```
SQL>    SELECT Sch.Scl_name AS School_Name, COUNT(Stu.Reg_no) AS Student_Strength
  2  FROM STUDENT Stu
  3  JOIN DEPARTMENT Dept ON Stu.Dept_id = Dept.Dept_id
  4  JOIN SCHOOL Sch ON Dept.SCode = Sch.SCode
  5  GROUP BY Sch.Scl_name
  6  HAVING COUNT(Stu.Reg_no) > 7000;

no rows selected
```

(xxii) List the name of the department(s) under school of medicine with student strength higher than the average students of all the departments in the school.

(xxiii) Given the registration number of a student, display the total credits registered by him/her in Winter 17–18

SELECT S.Reg_no, SUM(CR.Credits) AS Total_Credits FROM ENROLL E

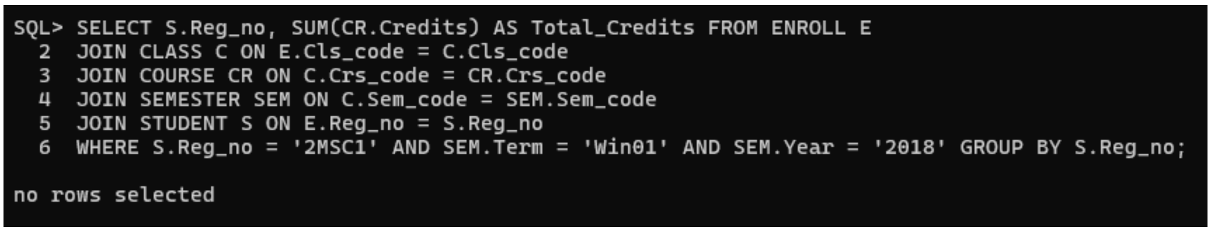
JOIN CLASS C ON E.Cls_code = C.Cls_code

JOIN COURSE CR ON C.Crs_code = CR.Crs_code

JOIN SEMESTER SEM ON C.Sem_code = SEM.Sem_code

JOIN STUDENT S ON E.Reg_no = S.Reg_no

WHERE S.Reg_no = '2MSC1' AND SEM.Term = 'Win01' AND SEM.Year = '2018' GROUP BY S.Reg_no;



```
SQL> SELECT S.Reg_no, SUM(CR.Credits) AS Total_Credits FROM ENROLL E
  2  JOIN CLASS C ON E.Cls_code = C.Cls_code
  3  JOIN COURSE CR ON C.Crs_code = CR.Crs_code
  4  JOIN SEMESTER SEM ON C.Sem_code = SEM.Sem_code
  5  JOIN STUDENT S ON E.Reg_no = S.Reg_no
  6  WHERE S.Reg_no = '2MSC1' AND SEM.Term = 'Win01' AND SEM.Year = '2018' GROUP BY S.Reg_no;

no rows selected
```

(xxiv) Given the registration number of a student, display her/his grade in the course she/he registered in Fall 17–18.

SELECT E.Cls_code, C.Crs_code, C.Crs_name, E.Grade

FROM ENROLL E

JOIN CLASS CL ON E.Cls_code = CL.Cls_code

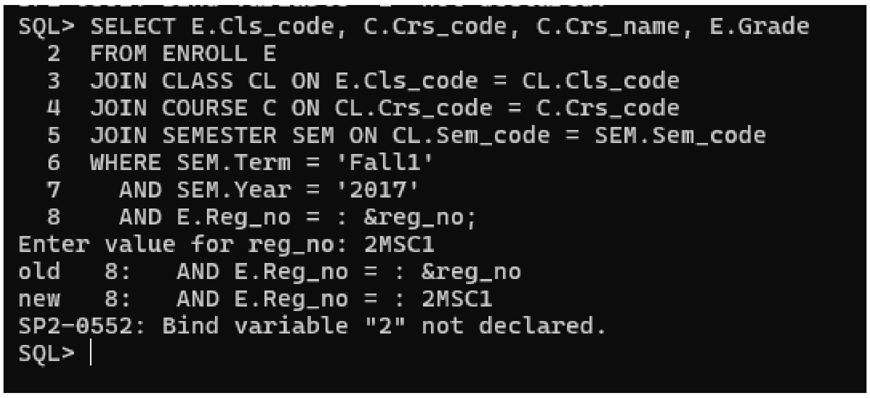
JOIN COURSE C ON CL.Crs_code = C.Crs_code

JOIN SEMESTER SEM ON CL.Sem_code = SEM.Sem_code

WHERE SEM.Term = 'Fall1'

AND SEM.Year = '2017'

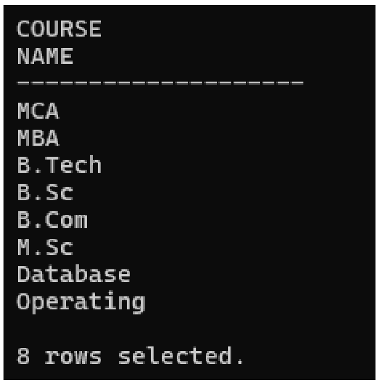
AND E.Reg_no = : &reg_no;



```
SQL> SELECT E.Cls_code, C.Crs_code, C.Crs_name, E.Grade
  2  FROM ENROLL E
  3  JOIN CLASS CL ON E.Cls_code = CL.Cls_code
  4  JOIN COURSE C ON CL.Crs_code = C.Crs_code
  5  JOIN SEMESTER SEM ON CL.Sem_code = SEM.Sem_code
  6  WHERE SEM.Term = 'Fall1'
  7    AND SEM.Year = '2017'
  8    AND E.Reg_no = : &reg_no;
Enter value for reg_no: 2MSC1
old   8:   AND E.Reg_no = : &reg_no
new   8:   AND E.Reg_no = : 2MSC1
SP2-0552: Bind variable "2" not declared.
SQL> |
```

(xxv) Display the name of the courses that are not being offered in Winter 17–18.

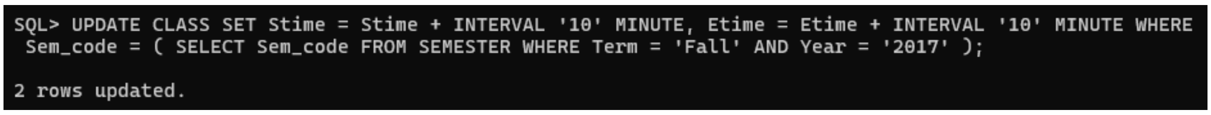
SELECT C.Crs_name FROM COURSE C WHERE C.Crs_code NOT IN (SELECT CL.Crs_code FROM CLASS CL JOIN SEMESTER SEM ON CL.Sem_code = SEM.Sem_code WHERE SEM.Term = 'Win01' AND SEM.Year = '2017');



```
COURSE
NAME
--------------------
MCA
MBA
B.Tech
B.Sc
B.Com
M.Sc
Database
Operating

8 rows selected.
```

(xxvi) Write necessary SQL statement to advance the start time and end time of every class by ten minutes in Fall 18–19.

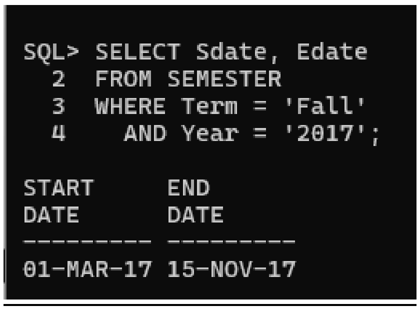
UPDATE CLASS SET Stime = Stime + INTERVAL '10' MINUTE, Etime = Etime + INTERVAL '10' MINUTE WHERE Sem_code = (SELECT Sem_code FROM SEMESTER WHERE Term = 'Fall' AND Year = '2017');



```
SQL> UPDATE CLASS SET Stime = Stime + INTERVAL '10' MINUTE, Etime = Etime + INTERVAL '10' MINUTE WHERE
 Sem_code = ( SELECT Sem_code FROM SEMESTER WHERE Term = 'Fall' AND Year = '2017' );

2 rows updated.
```

(xxvii) Write necessary SQL statement to advance the start date and end date of Fall 18–19 semester by one week with respect to Fall semester of 17 – 18.

BEFORE



```
SQL> SELECT Sdate, Edate
  2  FROM SEMESTER
  3  WHERE Term = 'Fall'
  4    AND Year = '2017';

START     END
DATE      DATE
--------- ---------
01-MAR-17 15-NOV-17
```

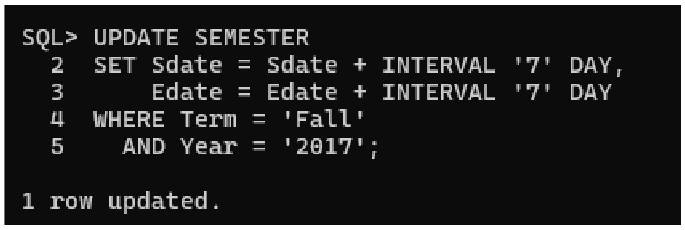
UPDATE SEMESTER

SET Sdate = Sdate + INTERVAL '7' DAY,

    Edate = Edate + INTERVAL '7' DAY

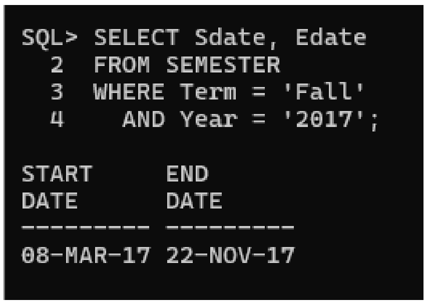
WHERE Term = 'Fall'

  AND Year = '2017';



```
SQL> UPDATE SEMESTER
  2  SET Sdate = Sdate + INTERVAL '7' DAY,
  3      Edate = Edate + INTERVAL '7' DAY
  4  WHERE Term = 'Fall'
  5    AND Year = '2017';

1 row updated.
```

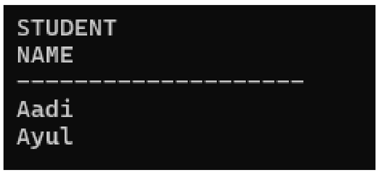
AFTER



```
SQL> SELECT Sdate, Edate
  2  FROM SEMESTER
  3  WHERE Term = 'Fall'
  4    AND Year = '2017';

START     END
DATE      DATE
--------- ---------
08-MAR-17 22-NOV-17
```

(xxviii) Find out the name list of students who had secured ‘S’ grade in at least 50% of the courses cleared by her/him.

```
SELECT S.Sname
FROM STUDENT S
WHERE
    (SELECT COUNT(*)
     FROM ENROLL E
     WHERE E.Reg_no = S.Reg_no AND E.Grade = 'S') >=
    (SELECT COUNT(*) / 2
     FROM ENROLL E
     WHERE E.Reg_no = S.Reg_no);
```



```
STUDENT
NAME
--------------------
Aadi
Ayul
```

(xxix) Given the registration number of a student, find out his/her free slots.

SELECT DISTINCT Cl.Slot

FROM CLASS Cl

WHERE Cl.Slot NOT IN (

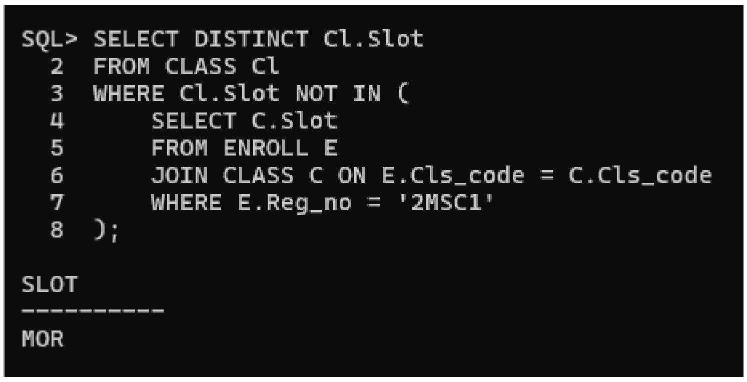
SELECT C.Slot

FROM ENROLL E

JOIN CLASS C ON E.Cls_code = C.Cls_code

WHERE E.Reg_no = '2MSC1'

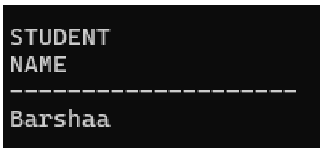
);



```
SQL> SELECT DISTINCT Cl.Slot
  2  FROM CLASS Cl
  3  WHERE Cl.Slot NOT IN (
  4      SELECT C.Slot
  5      FROM ENROLL E
  6      JOIN CLASS C ON E.Cls_code = C.Cls_code
  7      WHERE E.Reg_no = '2MSC1'
  8  );

SLOT
----------
MOR
```

(xxx) Find out the name list of students who have classes in the afternoon session only a specific day of the week.

SELECT DISTINCT S.Sname FROM STUDENT S JOIN ENROLL E ON S.Reg_no = E.Reg_no JOIN CLASS C ON E.Cls_code = C.Cls_code WHERE C.Day_of_week = 'Monday' -- Specify the day of the week AND Slot='Aft';

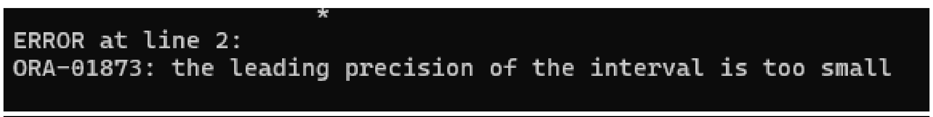


```
STUDENT
NAME
--------------------
Barshaa
```

(xxxi) Add a column named 'Duration' (to indicate duration of a class) with appropriate data type to the CLASS table and populate the column from values of start time and end time columns.

ALTER TABLE CLASS ADD Duration INTERVAL DAY TO SECOND;

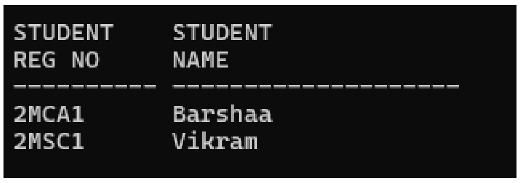
UPDATE CLASS SET Duration = Etime - Stime;



```
                        *
ERROR at line 2:
ORA-01873: the leading precision of the interval is too small
```

(xxxiii) Find out the list of students who are undergoing MCA program.

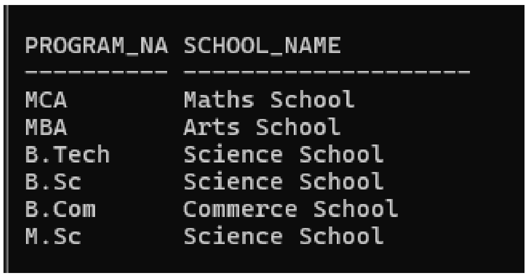
SELECT S.Reg_no, S.Sname FROM STUDENT S JOIN PROGRAMME P ON S.Dept_id = P.Dept_id WHERE P.Prog_name = 'MCA';



```
STUDENT    STUDENT
REG NO     NAME
---------- --------------------
2MCA1      Barshaa
2MSC1      Vikram
```

(xxxiv) Display the name of programs and the name of school offering the program.

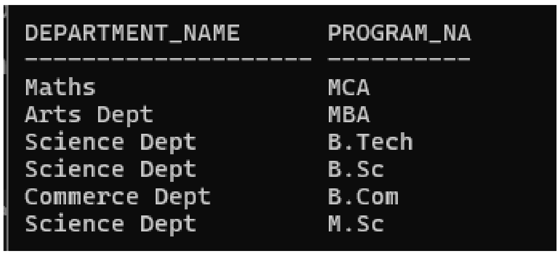
SELECT Prog.Prog_name AS Program_Name, Sch.Scl_name AS School_Name FROM PROGRAMME Prog JOIN SCHOOL Sch ON Prog.SCode = Sch.SCode;



```
PROGRAM_NA SCHOOL_NAME
---------- --------------------
MCA        Maths School
MBA        Arts School
B.Tech     Science School
B.Sc       Science School
B.Com      Commerce School
M.Sc       Science School
```

(xxxv) Display the name of the departments and the name of the program controlled by the department.

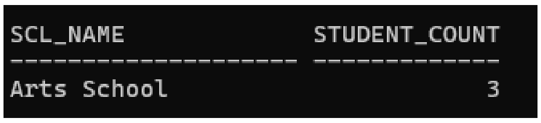
SELECT Dept.Dname AS Department_Name, Prog.Prog_name AS Program_Name FROM DEPARTMENT Dept JOIN PROGRAMME Prog ON Dept.Dept_id = Prog.Dept_id;



```
DEPARTMENT_NAME      PROGRAM_NA
-------------------- ----------
Maths                MCA
Arts Dept            MBA
Science Dept         B.Tech
Science Dept         B.Sc
Commerce Dept        B.Com
Science Dept         M.Sc
```

(xxxvi) Find the school which has highest school strength (i.e number of students)

SELECT Scl_name, Student_Count FROM (SELECT Sch.Scl_name, COUNT(Stu.Reg_no) AS Student_Count FROM STUDENT Stu JOIN DEPARTMENT Dept ON Stu.Dept_id = Dept.Dept_id JOIN SCHOOL Sch ON Dept.SCode = Sch.SCode GROUP BY Sch.Scl_name ORDER BY Student_Count DESC) WHERE ROWNUM = 1;



```
SCL_NAME             STUDENT_COUNT
-------------------- -------------
Arts School                      3
```