LAB EXPERIMENTS

PART A: SQL PROGRAMMING

A. Consider the following schema for a LibraryDatabase:

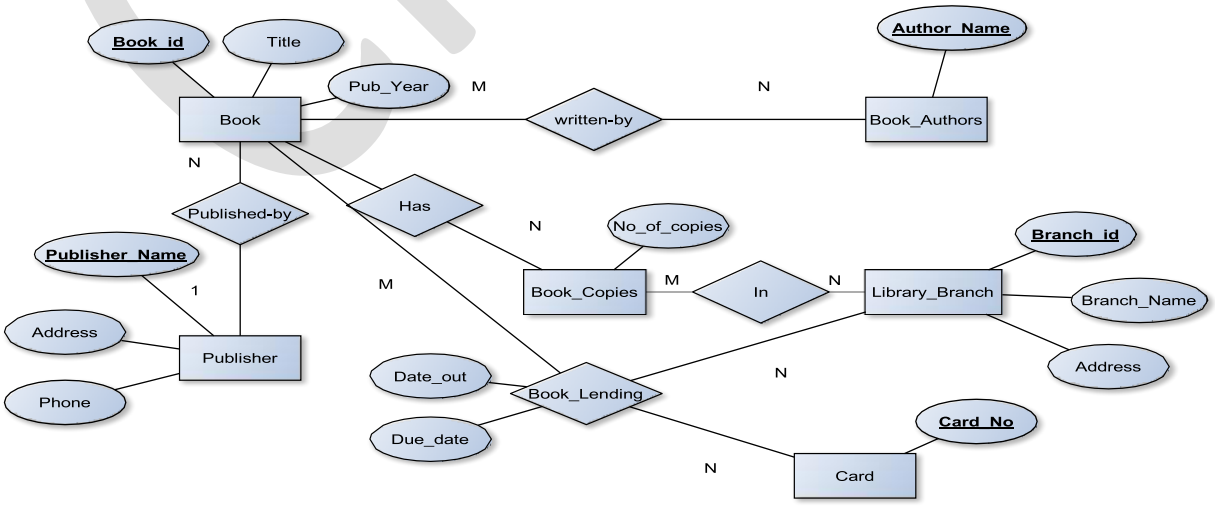
BOOK (*Book_id, Title, Publisher_Name, Pub_Year*)
BOOK_AUTHORS (Book_id, Author_*Name*)
PUBLISHER (*Name, Address, Phone*)
BOOK_COPIES (*Book_id, Branch_id, No-of_Copies*)
BOOK_LENDING (*Book_id, Branch_id, Card_No, Date_Out, Due_Date*)
LIBRARY_BRANCH (*Branch_id, Branch_Name, Address*)

Write SQL queries to

1. **Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch,etc.**
2. **Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun2017**
3. **Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.**
4. **Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.**
5. **Create a view of all books and its number of copies that are currently available in the Library.**

Solution:

Entity-Relationship Diagram



Schema Diagram

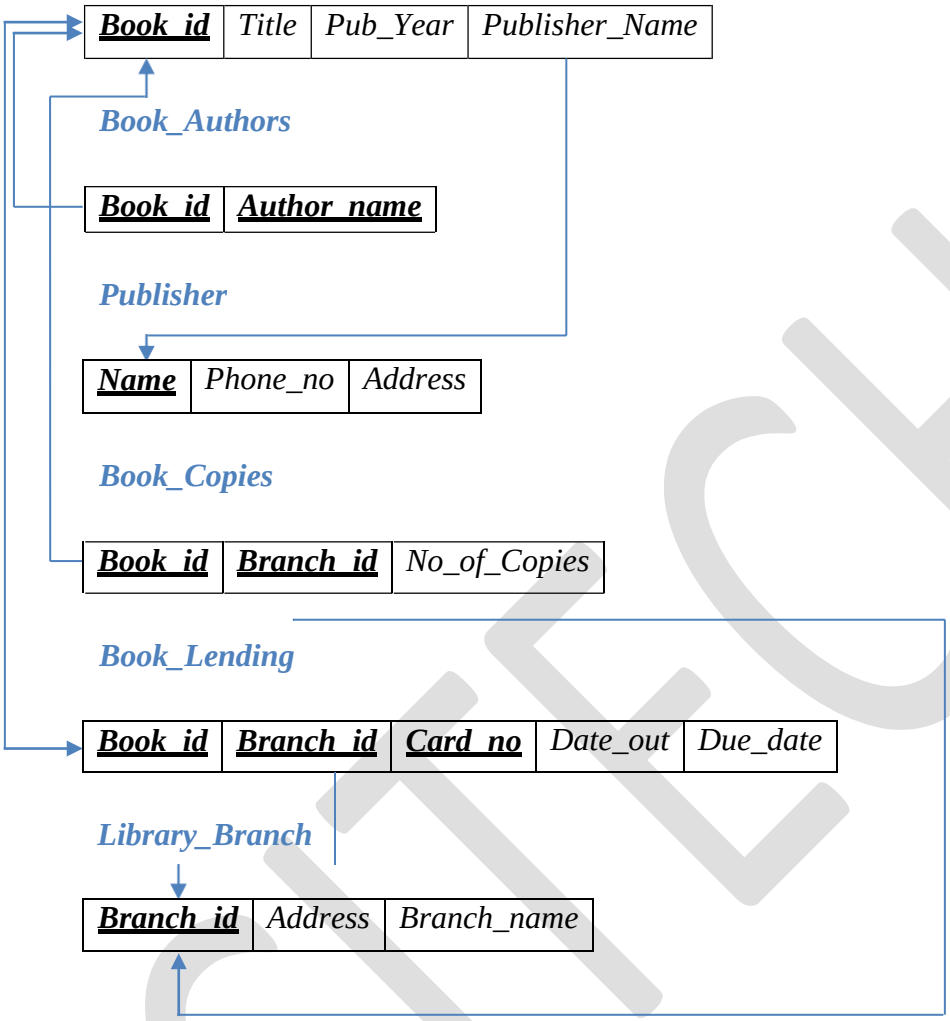


Table Creation

```
CREATE TABLE PUBLISHER
(NAME VARCHAR2 (20) PRIMARY KEY,
PHONE INTEGER,
ADDRESS VARCHAR2 (20));

CREATE TABLE BOOK
(BOOK_ID INTEGER PRIMARY KEY,
TITLE VARCHAR2 (20),
PUB_YEAR VARCHAR2 (20),
PUBLISHER_NAME REFERENCES PUBLISHER (NAME) ON DELETE CASCADE);
```

```
CREATE TABLE BOOK_AUTHORS
(AUTHOR_NAME VARCHAR2 (20),
BOOK_ID REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE,
PRIMARY KEY (BOOK_ID, AUTHOR_NAME));

CREATE TABLE LIBRARY_BRANCH
(BRANCH_ID INTEGER PRIMARY KEY,
BRANCH_NAME VARCHAR2 (50),
ADDRESS VARCHAR2 (50));

CREATE TABLE BOOK_COPIES
(NO_OF_COPIES INTEGER,
BOOK_ID REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE,
BRANCH_ID REFERENCES LIBRARY_BRANCH (BRANCH_ID) ON DELETE CASCADE,
PRIMARY KEY (BOOK_ID, BRANCH_ID));


CREATE TABLE BOOK_LENDING
(DATE_OUT DATE,
DUE_DATE DATE,
CARD_NO VARCHAR(10),
BOOK_ID REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE,
BRANCH_ID REFERENCES LIBRARY_BRANCH (BRANCH_ID) ON DELETE CASCADE,
PRIMARY KEY (BOOK_ID, BRANCH_ID));
```

Table Descriptions

DESC PUBLISHER;

```
SQL> desc publisher;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 NAME                                      NOT NULL VARCHAR2(20)
 PHONE                                              NUMBER(38)
 ADDRESS                                            VARCHAR2(20)
```

DESC BOOK;

```
SQL> DESC BOOK;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 BOOK_ID                                   NOT NULL NUMBER(38)
 TITLE                                              VARCHAR2(20)
 PUB_YEAR                                           VARCHAR2(20)
 PUBLISHER_NAME                                     VARCHAR2(20)
```

DESC BOOK_AUTHORS;

```
SQL> DESC BOOK_AUTHORS;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 AUTHOR_NAME                               NOT NULL VARCHAR2(20)
 BOOK_ID                                   NOT NULL NUMBER(38)
```

DESC LIBRARY_BRANCH;

```
SQL> DESC LIBRARY_BRANCH;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 BRANCH_ID                                 NOT NULL NUMBER(38)
 BRANCH_NAME                                        VARCHAR2(50)
 ADDRESS                                            VARCHAR2(50)
```

DESC BOOK_COPIES;

```
SQL> DESC BOOK_COPIES;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 NO_OF_COPIES                                       NUMBER(38)
 BOOK_ID                                   NOT NULL NUMBER(38)
 BRANCH_ID                                 NOT NULL NUMBER(38)
```

DESC CARD;

```
SQL> DESC CARD;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CARD_NO                                   NOT NULL NUMBER(38)
```

DESC BOOK_LENDING;

```
SQL> desc book_lending;
 Name
 ----------------------------------------------------------------------------------------------------
 DATE_OUT
 DUE_DATE
 BOOK_ID
 BRANCH_ID
 CARD_NO
```

Insertion of Values to Tables

INSERT INTO PUBLISHER VALUES (‘MCGRAW-HILL’, 9989076587, ‘BANGALORE’);
INSERT INTO PUBLISHER VALUES (‘PEARSON’, 9889076565, ‘NEWDELHI’);
INSERT INTO PUBLISHER VALUES (‘RANDOM HOUSE’, 7455679345, ‘HYDRABAD’);
INSERT INTO PUBLISHER VALUES (‘HACHETTE LIVRE’, 8970862340, ‘CHENAI’);
INSERT INTO PUBLISHER VALUES (‘GRUPO PLANETA’, 7756120238, ‘BANGALORE’);

INSERT INTO BOOK VALUES (1,’DBMS’,’JAN-2017’, ‘MCGRAW-HILL’);
INSERT INTO BOOK VALUES (2,’ADBMS’,’JUN-2016’, ‘MCGRAW-HILL’);
INSERT INTO BOOK VALUES (3,’CN’,’SEP-2016’, ‘PEARSON’);
INSERT INTO BOOK VALUES (4,’CG’,’SEP-2015’, ‘GRUPO PLANETA’);
INSERT INTO BOOK VALUES (5,’OS’,’MAY-2016’, ‘PEARSON’);

INSERT INTO BOOK_AUTHORS VALUES (’NAVATHE’, 1);
INSERT INTO BOOK_AUTHORS VALUES (’NAVATHE’, 2);
INSERT INTO BOOK_AUTHORS VALUES (’TANENBAUM’, 3);
INSERT INTO BOOK_AUTHORS VALUES (’EDWARD ANGEL’, 4);
INSERT INTO BOOK_AUTHORS VALUES (’GALVIN’, 5);

INSERT INTO LIBRARY_BRANCH VALUES (10,’RR NAGAR’,’BANGALORE’);
INSERT INTO LIBRARY_BRANCH VALUES (11,’RNSIT’,’BANGALORE’);
INSERT INTO LIBRARY_BRANCH VALUES (12,’RAJAJI NAGAR’, ’BANGALORE’);
INSERT INTO LIBRARY_BRANCH VALUES (13,’NITTE’,’MANGALORE’);
INSERT INTO LIBRARY_BRANCH VALUES (14,’MANIPAL’,’UDUPI’);

INSERT INTO BOOK_COPIES VALUES (10, 1, 10);
INSERT INTO BOOK_COPIES VALUES (5, 1, 11);
INSERT INTO BOOK_COPIES VALUES (2, 2, 12);
INSERT INTO BOOK_COPIES VALUES (5, 2, 13);
INSERT INTO BOOK_COPIES VALUES (7, 3, 14);
INSERT INTO BOOK_COPIES VALUES (1, 5, 10);
INSERT INTO BOOK_COPIES VALUES (3, 4, 11);

INSERT INTO CARD VALUES (100);
INSERT INTO CARD VALUES (101);
INSERT INTO CARD VALUES (102);
INSERT INTO CARD VALUES (103);
INSERT INTO CARD VALUES (104);

INSERT INTO BOOK_LENDING VALUES (’01-JAN-17’,’01-JUN-17’, 1, 10, 101);
INSERT INTO BOOK_LENDING VALUES (’11-JAN-17’,’11-MAR-17’, 3, 14, 101);
INSERT INTO BOOK_LENDING VALUES (’21-FEB-17’,’21-APR-17’, 2, 13, 101);
INSERT INTO BOOK_LENDING VALUES (’15-MAR-17’,’15-JUL-17’, 4, 11, 101);
INSERT INTO BOOK_LENDING VALUES (‘12-APR-17’,’12-MAY-17’, 1, 11, 104);
SELECT * FROM PUBLISHER;

```
SQL> select * from publisher;

NAME                      PHONE ADDRESS
-------------------- ---------- --------------------
MCGRAW-HILL          9989076587 BANGALORE
PEARSON              9889076565 NEWDELHI
RANDOM HOUSE         7455679345 HYDRABAD
HACHETTE LIVRE       8970862340 CHENAI
GRUPO PLANETA        7756120238 BANGALORE
```

SELECT * FROM BOOK;

```
SQL> SELECT * FROM BOOK;

   BOOK_ID TITLE                PUB_YEAR             PUBLISHER_NAME
---------- -------------------- -------------------- --------------------
         1 DBMS                 JAN-2017             MCGRAW-HILL
         2 ADBMS                JUN-2016             MCGRAW-HILL
         3 CN                   SEP-2016             PEARSON
         4 CG                   SEP-2015             GRUPO PLANETA
         5 OS                   MAY-2016             PEARSON
```

SELECT * FROM BOOK_AUTHORS;

```
SQL> SELECT * FROM BOOK_AUTHORS;

AUTHOR_NAME             BOOK_ID
-------------------- ----------
NAVATHE                      1
NAVATHE                      2
TANENBAUM                    3
EDWARD ANGEL                 4
GALVIN                       5
```

SELECT * FROM LIBRARY_BRANCH;

```
SQL> SELECT * FROM LIBRARY_BRANCH;

 BRANCH_ID BRANCH_NAME                                        ADDRESS
---------- -------------------------------------------------- ------------------------------------
        10 RR NAGAR                                           BANGALORE
        11 RNSIT                                              BANGALORE
        12 RAJAJI NAGAR                                       BANGALORE
        13 NITTE                                              MANGALORE
        14 MANIPAL                                            UDUPI
```

SELECT * FROM BOOK_COPIES;

```
SQL> SELECT * FROM BOOK_COPIES;

NO_OF_COPIES    BOOK_ID  BRANCH_ID
------------ ---------- ----------
          10          1         10
           5          1         11
           2          2         12
           5          2         13
           7          3         14
           1          5         10
           3          4         11
```

SELECT * FROM CARD;

```
SQL> SELECT * FROM CARD;

   CARD_NO
----------
       100
       101
       102
       103
       104
```

SELECT * FROM BOOK_LENDING;

```
SQL> select * from book_lending;

DATE_OUT  DUE_DATE     BOOK_ID  BRANCH_ID    CARD_NO
--------- --------- ---------- ---------- ----------
01-JAN-17 01-JUN-17          1         10        101
11-JAN-17 11-MAR-17          3         14        101
21-FEB-17 21-APR-17          2         13        101
15-MAR-17 15-JUL-17          4         11        101
12-APR-17 12-MAY-17          1         11        104
```

Queries:

1. **Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch,etc.**

   SELECT B.BOOK_ID, B.TITLE, B.PUBLISHER_NAME, A.AUTHOR_NAME, C.NO_OF_COPIES,L.PROGRAMME_ID
   FROM BOOK B, BOOK_AUTHORS A, BOOK_COPIES C,
   LIBRARY_PROGRAMME L WHERE B.BOOK_ID=A.BOOK_ID
   AND B.BOOK_ID=C.BOOK_ID
   AND L.PROGRAMME_ID=C.PROGRAMME_ID;

BOOK_ID	TITLE	PUBLISHER_NAME	AUTHOR_NAME	NO_OF_COPIES	BRANCH_ID
1	DBMS	MCGRAW-HILL	NAVATHE	10	10
1	DBMS	MCGRAW-HILL	NAVATHE	5	11
2	ADBMS	MCGRAW-HILL	NAVATHE	2	12
2	ADBMS	MCGRAW-HILL	NAVATHE	5	13
3	CN	PEARSON	TANENBAUM	7	14
5	OS	PEARSON	GALVIN	1	10
4	CG	GRUPO PLANETA	EDWARD ANGEL	3	11

2. **Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun2017.**

```
SELECT CARD_NO
FROM BOOK_LENDING
WHERE DATE_OUT BETWEEN '01-JAN-2017' AND '01-JUL-2017'
GROUP BY CARD_NO
HAVING COUNT (*)>3;
```

CARD_NO
101

3. **Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.**

```
DELETE FROM BOOK
WHERE BOOK_ID=3;
```

```
SQL> DELETE FROM BOOK
  2  WHERE BOOK_ID=3;

1 row deleted.

SQL> SELECT * FROM BOOK;
```

BOOK_ID	TITLE	PUB_YEAR	PUBLISHER_NAME
1	DBMS	JAN-2017	MCGRAW-HILL
2	ADBMS	JUN-2016	MCGRAW-HILL
4	CG	SEP-2015	GRUPO PLANETA
5	OS	MAY-2016	PEARSON

.

4. **Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.**

```
CREATE VIEW V_PUBLICATION AS
SELECT PUB_YEAR
FROM BOOK;
```

```
PUB_YEAR
-------------
JAN-2017
JUN-2016
SEP-2016
SEP-2015
MAY-2016
```

5. **Create a view of all books and its number of copies that are currently available in the Library.**

```
CREATE VIEW V_BOOKS AS
SELECT B.BOOK_ID, B.TITLE, C.NO_OF_COPIES
FROM BOOK B, BOOK_COPIES C, LIBRARY_BRANCH L
WHERE B.BOOK_ID=C.BOOK_ID
AND C.BRANCH_ID=L.BRANCH_ID;
```

```
  BOOK_ID TITLE                NO_OF_COPIES
--------- -------------------- ------------
        1 DBMS                           10
        1 DBMS                            5
        2 ADBMS                           2
        2 ADBMS                           5
        3 CN                              7
        5 OS                              1
        4 CG                              3
```

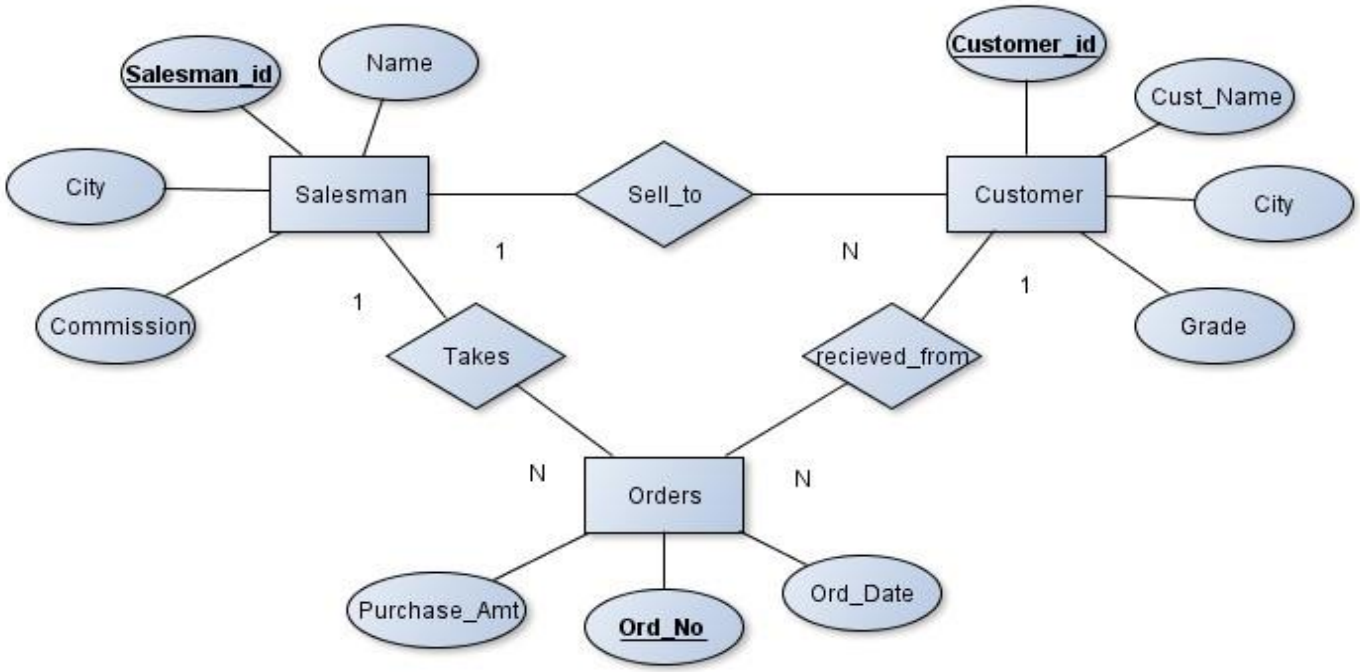
B. Consider the following schema for Order Database:

SALESMAN (*Salesman_id, Name, City, Commission*)
CUSTOMER (*Customer_id, Cust_Name, City, Grade,Salesman_id*)
ORDERS (*Ord_No, Purchase_Amt, Ord_Date, Customer_id, Salesman_id*)
Write SQL queries to

1. **Count the customers with grades above Bangalore's average.**
2. **Find the name and numbers of all salesmen who had more than one customer.**
3. **List all salesmen and indicate those who have and don't have customers in their cities (Use UNION operation.)**
4. **Create a view that finds the salesman who has the customer with the highest order of a day.**
5. **Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted.**

Solution:

Entity-Relationship Diagram



Schema Diagram

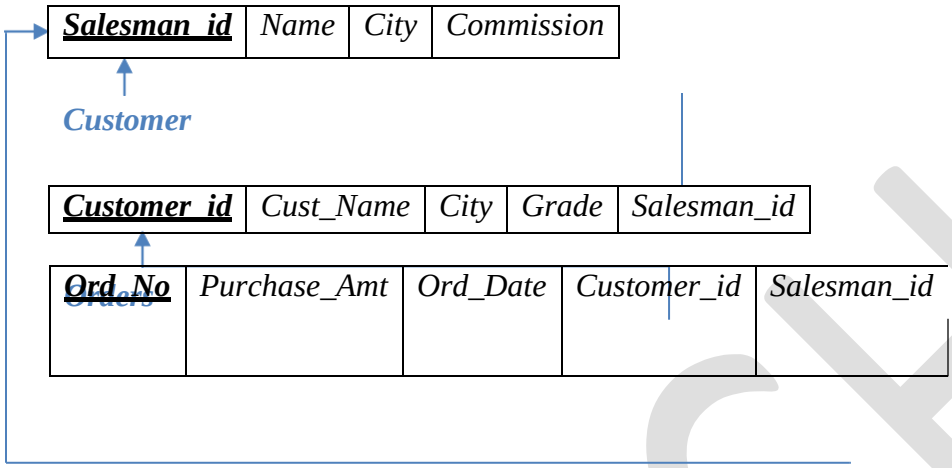


Table Creation

```
CREATE TABLE SALESMAN
(SALESMAN_ID NUMBER (4),
NAME VARCHAR2 (20),
CITY VARCHAR2 (20),
COMMISSION VARCHAR2 (20),
PRIMARYKEY        (SALESMAN_ID));

CREATE TABLE CUSTOMER1
(CUSTOMER_ID NUMBER (4),
CUST_NAME VARCHAR2 (20),
CITY VARCHAR2 (20),
GRADE NUMBER (3),
PRIMARY KEY (CUSTOMER_ID),
SALESMAN_ID REFERENCES SALESMAN (SALESMAN_ID) ON DELETE SET NULL);

CREATE TABLE ORDERS
(ORD_NO NUMBER (5),
PURCHASE_AMT NUMBER (10, 2),
ORD_DATE DATE,
PRIMARY KEY (ORD_NO),
CUSTOMER_ID REFERENCES CUSTOMER1 (CUSTOMER_ID) ON DELETE CASCADE,
SALESMAN_ID REFERENCES SALESMAN (SALESMAN_ID) ON DELETE CASCADE);
```

Table Descriptions

DESC SALESMAN;

```
SQL> DESC SALESMAN;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 SALESMAN_ID                               NOT NULL NUMBER(4)
 NAME                                               VARCHAR2(15)
 CITY                                               VARCHAR2(15)
 COMMISSION                                         NUMBER(3,2)
```

DESC CUSTOMER1;

```
SQL> DESC CUSTOMER1;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CUSTOMER_ID                               NOT NULL NUMBER(4)
 CUST_NAME                                          VARCHAR2(15)
 CITY                                               VARCHAR2(15)
 GRADE                                              NUMBER(3)
 SALESMAN_ID                                        NUMBER(4)
```

DESC ORDERS;

```
SQL> DESC ORDERS;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 ORD_NO                                    NOT NULL NUMBER(5)
 PURCHASE_AMT                                       NUMBER(10,2)
 ORD_DATE                                           DATE
 CUSTOMER_ID                                        NUMBER(4)
 SALESMAN_ID                                        NUMBER(4)
```

Insertion of Values to Tables

INSERT INTO SALESMAN VALUES (1000, ‘JOHN’,’BANGALORE’,’25 %’);
INSERT INTO SALESMAN VALUES (2000, ‘RAVI’,’BANGALORE’,’20 %’);
INSERT INTO SALESMAN VALUES (3000, ‘KUMAR’,’MYSORE’,’15 %’);
INSERT INTO SALESMAN VALUES (4000, ‘SMITH’,’DELHI’,’30 %’);
INSERT INTO SALESMAN VALUES (5000, ‘HARSHA’,’HYDRABAD’,’15%’);

INSERT INTO CUSTOMER1 VALUES (10, ‘PREETHI’,’BANGALORE’, 100, 1000);
INSERT INTO CUSTOMER1 VALUES (11, ‘VIVEK’,’MANGALORE’, 300, 1000);
INSERT INTO CUSTOMER1 VALUES (12, ‘BHASKAR’,’CHENNAI’, 400, 2000);
INSERT INTO CUSTOMER1 VALUES (13, ‘CHETHAN’,’BANGALORE’, 200, 2000);
INSERT INTO CUSTOMER1 VALUES (14, ‘MAMATHA’,’BANGALORE’, 400, 3000);

INSERT INTO ORDERS VALUES (50, 5000, ‘04-MAY-17’, 10, 1000);
INSERT INTO ORDERS VALUES (51, 450, ‘20-JAN-17’, 10, 2000);

INSERT INTO ORDERS VALUES (52, 1000, '24-FEB-17', 13, 2000);
INSERT INTO ORDERS VALUES (53, 3500, '13-APR-17', 14, 3000);
INSERT INTO ORDERS VALUES (54, 550, '09-MAR-17', 12, 2000);

SELECT * FROM SALESMAN;

SALESMAN_ID	NAME	CITY	COMMISSION
1000	JOHN	BANGALORE	25 %
2000	RAVI	BANGALORE	20 %
3000	KUMAR	MYSORE	15 %
4000	SMITH	DELHI	30 %
5000	HARSHA	HYDRABAD	15 %

SELECT * FROM CUSTOMER1;

CUSTOMER_ID	CUST_NAME	CITY	GRADE	SALESMAN_ID
10	PREETHI	BANGALORE	100	1000
11	VIVEK	MANGALORE	300	1000
12	BHASKAR	CHENNAI	400	2000
13	CHETHAN	BANGALORE	200	2000
14	MAMATHA	BANGALORE	400	3000

SELECT * FROM ORDERS;

ORD_NO	PURCHASE_AMT	ORD_DATE	CUSTOMER_ID	SALESMAN_ID
50	5000	04-MAY-17	10	1000
51	450	20-JAN-17	10	2000
52	1000	24-FEB-17	13	2000
53	3500	13-APR-17	14	3000
54	550	09-MAR-17	12	2000

Queries:

1. **Count the customers with grades above Bangalore'saverage.**

```
SELECT GRADE, COUNT (DISTINCT CUSTOMER_ID)
FROMCUSTOMER1
GROUP BY GRADE
HAVING GRADE > (SELECT AVG(GRADE)
FROM CUSTOMER1
WHERE CITY='BANGALORE');
```

GRADE	COUNT(DISTINCTCUSTOMER_ID)
300	1
400	2

2. **Find the name and numbers of all salesmen who had more than one customer.**

```
SELECT SALESMAN_ID, NAME
 FROM SALESMAN A
 WHERE 1 < (SELECT COUNT (*)
        FROM CUSTOMER1
 WHERE SALESMAN_ID=A.SALESMAN_ID);
```

```
SALESMAN_ID NAME
----------- --------------------
       1000 JOHN
       2000 RAVI
```

3. **List all salesmen and indicate those who have and don't have customers in their cities (Use UNIONoperation.)**

```
SELECT SALESMAN.SALESMAN_ID, NAME, CUST_NAME, COMMISSION
FROM SALESMAN, CUSTOMER1
WHERE SALESMAN.CITY = CUSTOMER1.CITY
UNION
SELECT SALESMAN_ID, NAME, 'NO MATCH', COMMISSION
FROM SALESMAN
WHERE NOT CITY = ANY
 (SELECT CITY
  FROM CUSTOMER1)
ORDER BY 2 DESC;
```

```
SALESMAN_ID NAME                 CUST_NAME            COMMISSION
----------- -------------------- -------------------- --------------------
       4000 SMITH                NO MATCH             30 %
       2000 RAVI                 CHETHAN              20 %
       2000 RAVI                 MAMATHA              20 %
       2000 RAVI                 PREETHI              20 %
       3000 KUMAR                NO MATCH             15 %
       1000 JOHN                 CHETHAN              25 %
       1000 JOHN                 MAMATHA              25 %
       1000 JOHN                 PREETHI              25 %
       5000 HARSHA               NO MATCH             15 %
```

4. **Create a view that finds the salesman who has the customer with the highest order of a day.**

```
CREATE VIEW ELITSALESMAN AS
SELECT B.ORD_DATE, A.SALESMAN_ID, A.NAME
FROM SALESMAN A, ORDERS B
```

```
WHERE A.SALESMAN_ID = B.SALESMAN_ID
AND B.PURCHASE_AMT=(SELECT MAX (PURCHASE_AMT)
                                    FROM ORDERS C
                                        WHERE C.ORD_DATE = B.ORD_DATE);
```

```
ORD_DATE  SALESMAN_ID NAME
--------- ----------- --------------------
04-MAY-17        1000 JOHN
20-JAN-17        2000 RAVI
24-FEB-17        2000 RAVI
13-APR-17        3000 KUMAR
09-MAR-17        2000 RAVI
```

5. Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also bedeleted.

Use ON DELETE CASCADE at the end of foreign key definitions while creating child table orders and then execute the following:

Use ON DELETE SET NULL at the end of foreign key definitions while creating child table customers and then executes the following:

```
DELETE FROM SALESMAN
WHERE SALESMAN_ID=1000;
```

```
SQL> DELETE FROM SALESMAN
  2  WHERE SALESMAN_ID=1000;

1 row deleted.

SQL> SELECT * FROM SALESMAN;

SALESMAN_ID NAME                 CITY                 COMMISSION
----------- -------------------- -------------------- ----------
       2000 RAVI                 BANGALORE            20 %
       3000 KUMAR                MYSORE               15 %
       4000 SMITH                DELHI                30 %
       5000 HARSHA               HYDRABAD             15 %
```

C. Consider the schema for MovieDatabase:

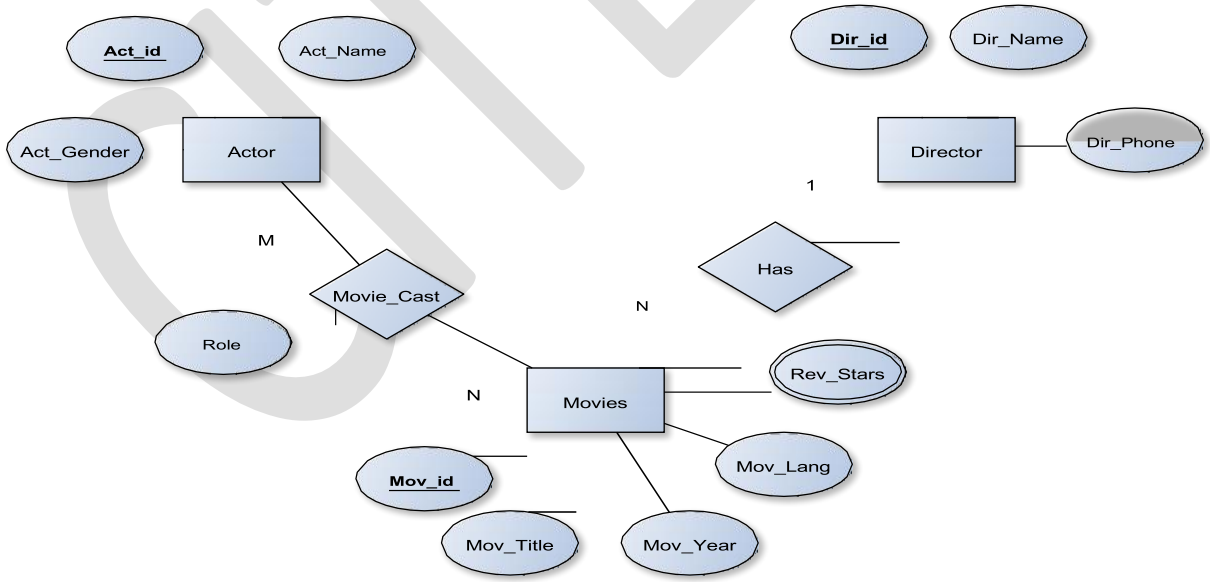
ACTOR (*Act_id, Act_Name, Act_Gender*)
DIRECTOR (*Dir_id, Dir_Name, Dir_Phone*)
MOVIES (*Mov_id, Mov_Title, Mov_Year, Mov_Lang, Dir_id*)
MOVIE_CAST (*Act_id, Mov_id, Role*)
RATING (*Mov_id, Rev_Stars*)

Write SQL queries to

1. **List the titles of all movies directed by'Hitchcock'.**
2. **Find the movie names where one or more actors acted in two or moremovies.**
3. **List all actors who acted in a movie before 2000 and also in a movieafter 2015 (use JOINoperation).**
4. **Find the title of movies and number of stars for each movie that has at least one rating and find the highest number of stars that movie received. Sort the result by movietitle.**
5. **Update rating of all movies directed by 'Steven Spielberg' to5.**

Solution:

Entity-Relationship Diagram



Schema Diagram

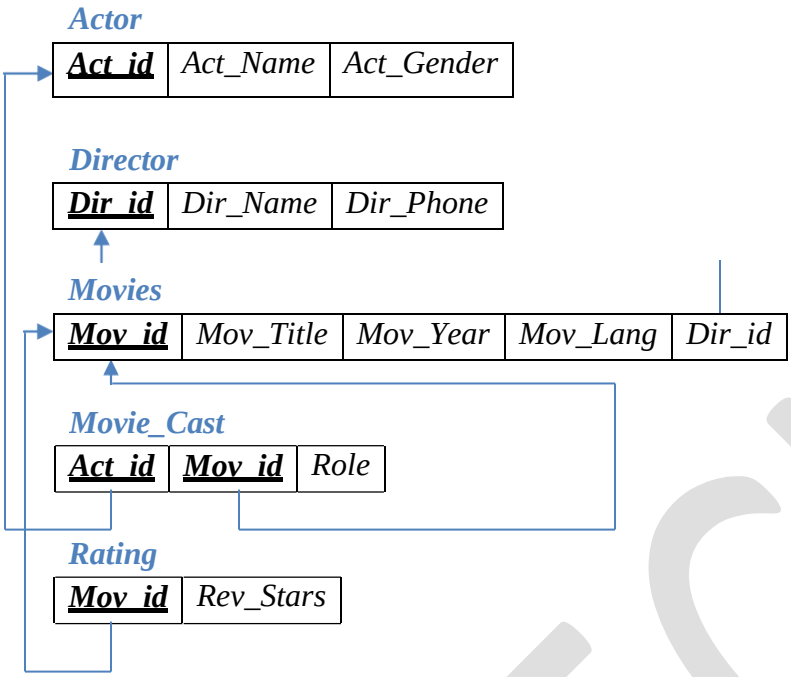


Table Creation

```
CREATE TABLE ACTOR (
ACT_ID NUMBER (3),
ACT_NAME  VARCHAR (20),
ACT_GENDER CHAR (1),
PRIMARY KEY (ACT_ID));

CREATE TABLE DIRECTOR (
DIR_ID NUMBER (3),
DIR_NAME VARCHAR (20),
DIR_PHONE NUMBER (10),
PRIMARY KEY (DIR_ID));

CREATE TABLE MOVIES (
MOV_ID NUMBER (4),
MOV_TITLE  VARCHAR (25),
MOV_YEAR  NUMBER (4),
MOV_LANG  VARCHAR (12),
DIR_ID NUMBER (3),
PRIMARY KEY (MOV_ID),
FOREIGN KEY (DIR_ID) REFERENCES DIRECTOR (DIR_ID));
```

```
CREATE TABLE MOVIE_CAST (
ACT_ID NUMBER (3),
MOV_ID NUMBER (4),
ROLE  VARCHAR (10),
PRIMARY KEY (ACT_ID, MOV_ID),
FOREIGN KEY (ACT_ID) REFERENCES ACTOR (ACT_ID),
FOREIGN KEY (MOV_ID) REFERENCES MOVIES (MOV_ID));

CREATE TABLE RATING (
MOV_ID NUMBER (4),
REV_STARS VARCHAR (25),
PRIMARY KEY (MOV_ID),
FOREIGN KEY (MOV_ID) REFERENCES MOVIES (MOV_ID));
```

Table Descriptions

DESC ACTOR;

```
SQL> DESC ACTOR;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 ACT_ID                                    NOT NULL NUMBER(3)
 ACT_NAME                                           VARCHAR2(20)
 ACT_GENDER                                         CHAR(1)
```

DESC DIRECTOR;

```
SQL> DESC DIRECTOR;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 DIR_ID                                    NOT NULL NUMBER(3)
 DIR_NAME                                           VARCHAR2(20)
 DIR_PHONE                                          NUMBER(10)
```

DESC MOVIES;

```
SQL> DESC MOVIES;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MOV_ID                                    NOT NULL NUMBER(4)
 MOV_TITLE                                          VARCHAR2(25)
 MOV_YEAR                                           NUMBER(4)
 MOV_LANG                                           VARCHAR2(12)
 DIR_ID                                             NUMBER(3)
```

DESC MOVIE_CAST;

```
SQL> DESC MOVIE_CAST;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 ACT_ID                                    NOT NULL NUMBER(3)
 MOV_ID                                    NOT NULL NUMBER(4)
 ROLE                                               VARCHAR2(10)
```

DESC RATING;

```
SQL> DESC RATING;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MOV_ID                                    NOT NULL NUMBER(4)
 REV_STARS                                          VARCHAR2(25)
```

Insertion of Values to Tables

INSERT INTO ACTOR VALUES (301,'ANUSHKA','F');
INSERT INTO ACTOR VALUES (302,'PRABHAS','M');
INSERT INTO ACTOR VALUES (303,'PUNITH','M');
INSERT INTO ACTOR VALUES (304,'JERMY','M');

INSERT INTO DIRECTOR VALUES (60,'RAJAMOULI', 8751611001);
INSERT INTO DIRECTOR VALUES (61,'HITCHCOCK', 7766138911);
INSERT INTO DIRECTOR VALUES (62,'FARAN', 9986776531);
INSERT INTO DIRECTOR VALUES (63,'STEVEN SPIELBERG', 8989776530);

INSERT INTO MOVIES VALUES (1001,'BAHUBALI-2', 2017, 'TELAGU', 60);
INSERT INTO MOVIES VALUES (1002,'BAHUBALI-1', 2015, 'TELAGU', 60);
INSERT INTO MOVIES VALUES (1003,'AKASH', 2008, 'KANNADA', 61);
INSERT INTO MOVIES VALUES (1004,'WAR HORSE', 2011, 'ENGLISH', 63);

INSERT INTO MOVIE_CAST VALUES (301, 1002, 'HEROINE');
INSERT INTO MOVIE_CAST VALUES (301, 1001, 'HEROINE');
INSERT INTO MOVIE_CAST VALUES (303, 1003, 'HERO');
INSERT INTO MOVIE_CAST VALUES (303, 1002, 'GUEST');
INSERT INTO MOVIE_CAST VALUES (304, 1004, 'HERO');

INSERT INTO RATING VALUES (1001, 4);
INSERT INTO RATING VALUES (1002, 2);

INSERT INTO RATING VALUES (1003, 5);
INSERT INTO RATING VALUES (1004, 4);

SELECT * FROM ACTOR;

```
SQL> SELECT * FROM ACTOR;

    ACT_ID ACT_NAME             A
---------- -------------------- -
       301 ANUSHKA              F
       302 PRABHAS              M
       303 PUNITH               M
       304 JERMY                M
```

SELECT * FROM DIRECTOR;

```
SQL> SELECT * FROM DIRECTOR;

    DIR_ID DIR_NAME              DIR_PHONE
---------- -------------------- ----------
        60 RAJAMOULI            8751611001
        61 HITCHCOCK            7766138911
        62 FARAN                9986776531
        63 STEVEN SPIELBERG     8989776530
```

SELECT * FROM MOVIES;

```
SQL> SELECT * FROM MOVIES;

    MOV_ID MOV_TITLE                MOV_YEAR MOV_LANG         DIR_ID
---------- ------------------------ ---------- ------------ ----------
      1001 BAHUBALI-2                     2017 TELAGU               60
      1002 BAHUBALI-1                     2015 TELAGU               60
      1003 AKASH                          2008 KANNADA              61
      1004 WAR HORSE                      2011 ENGLISH              63
```

SELECT * FROM MOVIE_CAST;

```
SQL> SELECT * FROM MOVIE_CAST;

    ACT_ID     MOV_ID ROLE
---------- ---------- ----------
       301       1002 HEROINE
       301       1001 HEROINE
       303       1003 HERO
       303       1002 GUEST
       304       1004 HERO
```

SELECT * FROM RATING;

```
SQL> SELECT * FROM RATING;

    MOV_ID REV_STARS
---------- -----------
      1001 4
      1002 2
      1003 5
      1004 4
```

Queries:

1. **List the titles of all movies directed by‘Hitchcock’.**

```
SELECT MOV_TITLE
FROM MOVIES
WHERE DIR_ID IN (SELECT DIR_ID
                 FROM DIRECTOR
                 WHERE DIR_NAME = ‘HITCHCOCK’);
```

```
MOV_TITLE
-------------------------
AKASH
```

2. **Find the movie names where one or more actors acted in two or moremovies.**

```
SELECT MOV_TITLE
FROM MOVIES M, MOVIE_CAST MV
WHERE M.MOV_ID=MV.MOV_ID AND ACT_ID IN (SELECT ACT_ID
                                        FROM MOVIE_CAST GROUP BY ACT_ID
                                        HAVING COUNT (ACT_ID)>1)
GROUP BY MOV_TITLE
HAVING COUNT (*)>1;
```

```
MOV_TITLE
-------------------------
BAHUBALI-1
```

3. **List all actors who acted in a movie before 2000 and also in a movie after 2015 (use JOINoperation).**

```
SELECT ACT_NAME, MOV_TITLE, MOV_YEAR
```

```
FROM ACTOR A
JOIN MOVIE_CASTC
        ON A.ACT_ID=C.ACT_ID
JOIN MOVIES M
        ON C.MOV_ID=M.MOV_ID
WHERE M.MOV_YEAR NOT BETWEEN 2000 AND 2015;
```

OR

```
SELECT A.ACT_NAME, A.ACT_NAME, C.MOV_TITLE, C.MOV_YEAR
FROM ACTOR A, MOVIE_CAST B, MOVIES C
WHERE A.ACT_ID=B.ACT_ID
AND B.MOV_ID=C.MOV_ID
AND C.MOV_YEAR NOT BETWEEN 2000 AND 2015;
```

ACT_NAME	MOV_TITLE	MOV_YEAR
ANUSHKA	BAHUBALI-2	2017

4. Find the title of movies and number of stars for each movie that has at least one rating and find the highest number of stars that movie received. Sort the result by movietitle.

```
SELECT MOV_TITLE, MAX (REV_STARS)
FROM MOVIES
INNER JOIN RATING USING (MOV_ID)
GROUP BY MOV_TITLE
HAVING MAX (REV_STARS)>0
ORDER BY MOV_TITLE;
```

MOV_TITLE	MAX(REV_STARS)
AKASH	5
BAHUBALI-1	2
BAHUBALI-2	4
WAR HORSE	4

5. Update rating of all movies directed by 'Steven Spielberg' to5

KL

```
UPDATE RATING
SET REV_STARS=5
WHERE MOV_ID IN (SELECT MOV_ID FROM MOVIES
                 WHERE DIR_ID IN (SELECT DIR_ID
                                  FROM DIRECTOR
                                  WHERE DIR_NAME = 'STEVEN
                                  SPIELBERG'));
```

```
SQL> SELECT * FROM RATING;

    MOV_ID REV_STARS
---------- -------------------------
      1001 4
      1002 2
      1003 5
      1004 5
```

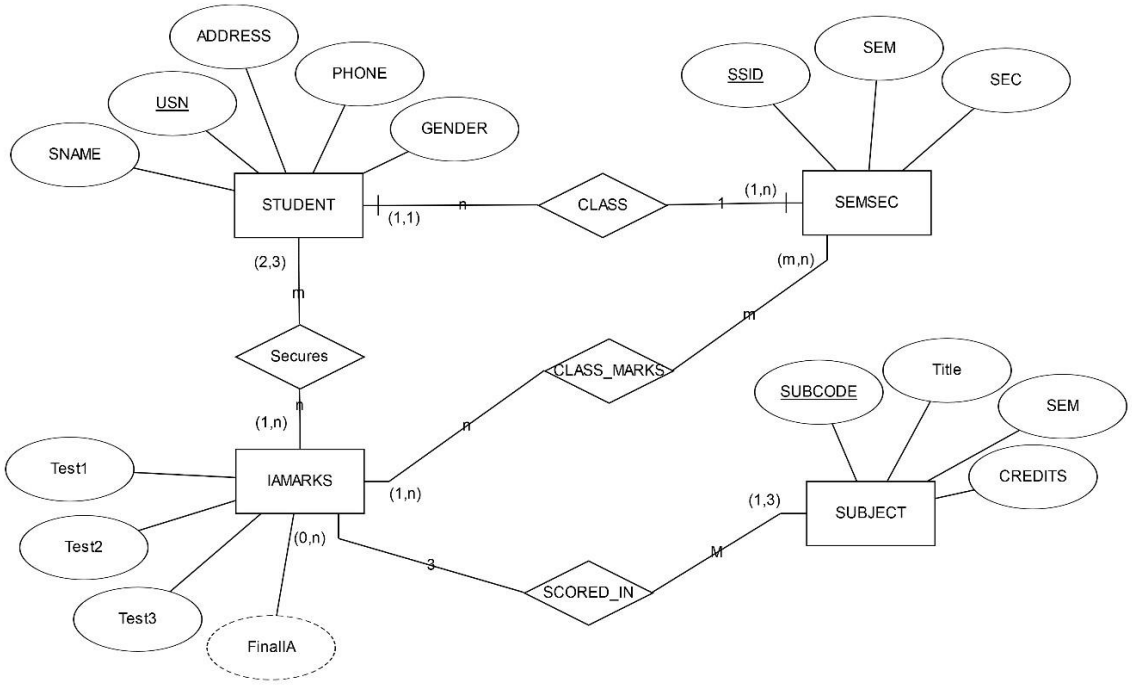
D. Consider the schema for CollegeDatabase:

STUDENT (*USN, SName, Address, Phone, Gender*)
SEMSEC (*SSID, Sem, Sec*)
CLASS (*USN, SSID*)
SUBJECT (*Subcode, Title, Sem, Credits*)
IAMARKS (*USN, Subcode, SSID, Test1, Test2, Test3, FinalIA*)
Write SQL queries to

1. **List all the student details studying in fourth semester 'C'section.**
2. **Compute the total number of male and female students in each semester and in each section.**
3. **Create a view of Test1 marks of student USN '1BI15CS101' in allsubjects.**
4. **Calculate the FinalIA (average of best two test marks) and update thecorresponding table for allstudents.**
5. **Categorize students based on the followingcriterion:**
   If FinalIA = 17 to 20 then CAT ='Outstanding'
   If FinalIA = 12 to 16 then CAT = 'Average'
   If FinalIA< 12 then CAT = 'Weak'
   Give these details only for 8th semester A, B, and C section students.

Solution:

Entity - Relationship Diagram



Schema Diagram

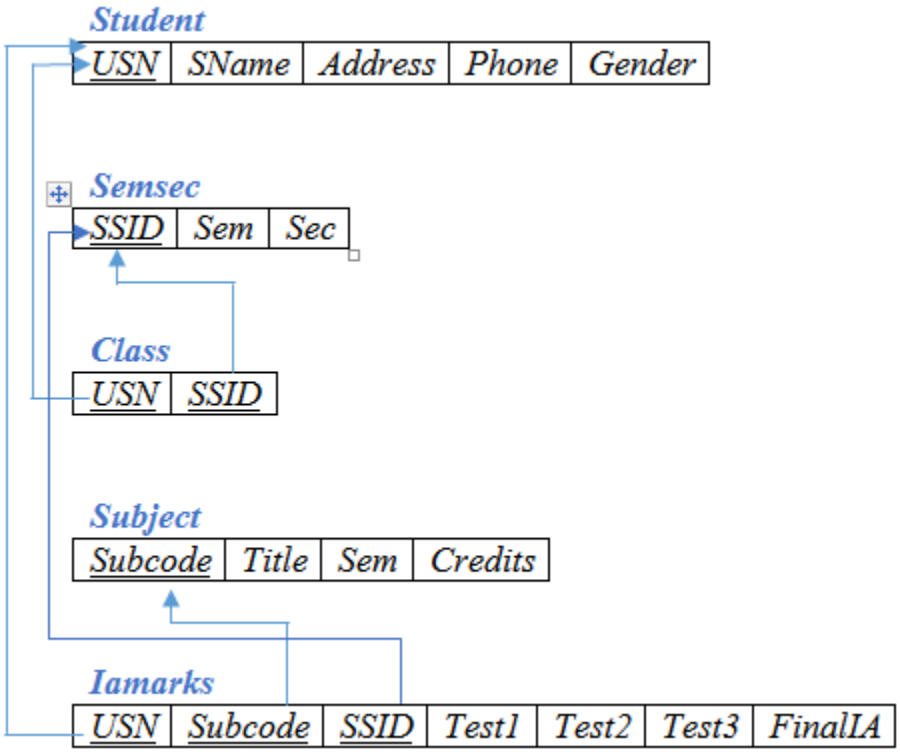


Table Creation

```
CREATE TABLE STUDENT (
 USN VARCHAR (10) PRIMARY KEY,
 SNAME VARCHAR (25),
 ADDRESS VARCHAR (25),
 PHONE NUMBER (10),
 GENDER CHAR (1));

CREATE TABLE SEMSEC (
SSID VARCHAR (5) PRIMARY KEY,
SEM NUMBER (2),
SEC CHAR (1));

CREATE TABLE CLASS (
USN VARCHAR (10),
SSID VARCHAR (5),
PRIMARY KEY (USN, SSID),
FOREIGN KEY (USN) REFERENCES STUDENT (USN),
FOREIGN KEY (SSID) REFERENCES SEMSEC (SSID));
```

```
CREATE TABLE SUBJECT (
SUBCODE VARCHAR (8),
TITLE VARCHAR (20),
SEM NUMBER (2),
CREDITS NUMBER (2),
PRIMARY KEY (SUBCODE));

 CREATE TABLE IAMARKS (
 USN VARCHAR (10),
 SUBCODE VARCHAR (8),
 SSID VARCHAR (5),
 TEST1 NUMBER (2),
 TEST2 NUMBER (2),
 TEST3 NUMBER (2),
 FINALIA NUMBER (2),
 PRIMARY KEY (USN, SUBCODE, SSID),
FOREIGN KEY (USN) REFERENCES STUDENT (USN),
 FOREIGN KEY (SUBCODE) REFERENCES SUBJECT (SUBCODE),
 FOREIGN KEY (SSID) REFERENCES SEMSEC (SSID));
```

Table Descriptions

DESC STUDENT;

```
Name
--------------------------------------------------------------------------------------------
USN
SNAME
ADDRESS
PHONE
GENDER
```

DESC SEMSEC;

```
SQL> DESC SEMSEC;
 Name
 ------------------------------------------------------------------------------------------
 SSID
 SEM
 SEC
```

DESC CLASS;

```
SQL> DESC CLASS;
 Name
 -----------------------------------------
 USN
 SSID
```

DESC SUBJECT;

```
SQL> DESC SUBJECT1;
 Name
 ----------------------------------
 SUBCODE
 TITLE
 SEM
 CREDITS
```

DESC IAMARKS;

```
SQL> DESC IAMARKS;
 Name
 -----------------------------------------------
 USN
 SUBCODE
 SSID
 TEST1
 TEST2
 TEST3
 FINALIA
```

Insertion of values to tables

INSERT INTO STUDENT VALUES ('1RN13CS020','AKSHAY','BELAGAVI', 8877881122,'M');
INSERT INTO STUDENT VALUES ('1RN13CS062','SANDHYA','BENGALURU', 7722829912,'F');
INSERT INTO STUDENT VALUES ('1RN13CS091','TEESHA','BENGALURU', 7712312312,'F');
INSERT INTO STUDENT VALUES ('1RN13CS066','SUPRIYA','MANGALURU', 8877881122,'F');
INSERT INTO STUDENTVALUES ('1RN14CS010','ABHAY','BENGALURU', 9900211201,'M');
INSERT INTO STUDENT VALUES ('1RN14CS032','BHASKAR','BENGALURU', 9923211099,'M');
INSERT INTO STUDENTVALUES ('1RN14CS025','ASMI','BENGALURU', 7894737377,'F');
INSERT INTO STUDENT VALUES ('1RN15CS011','AJAY','TUMKUR', 9845091341,'M');

```
INSERT INTO STUDENT VALUES ('1RN15CS029','CHITRA','DAVANGERE',
7696772121,'F');
INSERT INTO STUDENT VALUES ('1RN15CS045','JEEVA','BELLARY', 9944850121,'M');
INSERT INTO STUDENT VALUES ('1RN15CS091','SANTOSH','MANGALURU',
8812332201,'M');
INSERT INTO STUDENT VALUES ('1RN16CS045','ISMAIL','KALBURGI',
9900232201,'M');
INSERT INTO STUDENT VALUES ('1RN16CS088','SAMEERA','SHIMOGA',
9905542212,'F');
INSERT INTO STUDENT VALUES ('1RN16CS122','VINAYAKA','CHIKAMAGALUR',
8800880011,'M');

INSERT INTO SEMSEC VALUES ('CSE8A', 8,'A');
INSERT INTO SEMSEC VALUES ('CSE8B', 8,'B');
INSERT INTO SEMSEC VALUES ('CSE8C',8,'C');

INSERT INTO SEMSEC VALUES ('CSE7A', 7,'A');
INSERT INTO SEMSEC VALUES ('CSE7B',7,'B');
INSERT INTO SEMSEC VALUES ('CSE7C',7,'C');

INSERT INTO SEMSEC VALUES ('CSE6A', 6,'A');
INSERT INTO SEMSEC VALUES ('CSE6B', 6,'B');
INSERT INTO SEMSEC VALUES ('CSE6C', 6,'C');

INSERT INTO SEMSEC VALUES ('CSE5A', 5,'A');
INSERT INTO SEMSEC VALUES ('CSE5B', 5,'B');
INSERT INTO SEMSEC VALUES ('CSE5C', 5,'C');

INSERT INTO SEMSEC VALUES ('CSE4A', 4,'A');
INSERT INTO SEMSEC VALUES ('CSE4B', 4,'B');
INSERT INTO SEMSEC VALUES ('CSE4C', 4,'C');

INSERT INTO SEMSEC VALUES ('CSE3A', 3,'A');
INSERT INTO SEMSEC VALUES ('CSE3B', 3,'B');
INSERT INTO SEMSEC VALUES ('CSE3C', 3,'C');

INSERT INTO SEMSEC VALUES ('CSE2A', 2,'A');
INSERT INTO SEMSEC VALUES ('CSE2B', 2,'B');
INSERT INTO SEMSEC VALUES ('CSE2C', 2,'C');
INSERT INTO SEMSEC VALUES ('CSE1A', 1,'A');
```

```
INSERT INTO SEMSEC VALUES (‘CSE1B’, 1,’B’);
INSERT INTO SEMSEC VALUES ('CSE1C', 1,’C’);

INSERT INTO CLASS VALUES (‘1RN13CS020’,’CSE8A’);
INSERT INTO CLASS VALUES (‘1RN13CS062’,’CSE8A’);
INSERT INTO CLASS VALUES (‘1RN13CS066’,’CSE8B’);
INSERT INTO CLASS VALUES (‘1RN13CS091’,’CSE8C’);

INSERT INTO CLASS VALUES (‘1RN14CS010’,’CSE7A’);
INSERT INTO CLASS VALUES (‘1RN14CS025’,’CSE7A’);
INSERT INTO CLASS VALUES (‘1RN14CS032’,’CSE7A’);

INSERT INTO CLASS VALUES (‘1RN15CS011’,’CSE4A’);
INSERT INTO CLASS VALUES (‘1RN15CS029’,’CSE4A’);
INSERT INTO CLASS VALUES (‘1RN15CS045’,’CSE4B’);
INSERT INTO CLASS VALUES (‘1RN15CS091’,’CSE4C’);

INSERT INTO CLASS VALUES (‘1RN16CS045’,’CSE3A’);
INSERT INTO CLASS VALUES (‘1RN16CS088’,’CSE3B’);
INSERT INTO CLASS VALUES (‘1RN16CS122’,’CSE3C’);

INSERT INTO SUBJECT VALUES ('10CS81','ACA', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS82','SSM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS83','NM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS84','CC', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS85','PW', 8, 4);

INSERT INTO SUBJECT VALUES ('10CS71','OOAD', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS72','ECS', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS73','PTW', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS74','DWDM', 7, 4);
INSERT INTO SUBJECT VALUES (‘10CS75','JAVA', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS76','SAN', 7, 4);

INSERT INTO SUBJECT VALUES ('15CS51', 'ME', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS52','CN', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS53','DBMS', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS54','ATC', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS55','JAVA', 5, 3);
INSERT INTO SUBJECT VALUES ('15CS56','AI', 5, 3);
```

```
INSERT INTO SUBJECT VALUES ('15CS41','M4', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS42','SE', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS43','DAA', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS44','MPMC', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS45','OOC', 4, 3);
INSERT INTO SUBJECT VALUES ('15CS46','DC', 4, 3);

INSERT INTO SUBJECT VALUES ('15CS31','M3', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS32','ADE', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS33','DSA', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS34','CO', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS35','USP', 3, 3);
INSERT INTO SUBJECT VALUES ('15CS36','DMS', 3, 3);

INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS81','CSE8C', 15, 16, 18);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS82','CSE8C', 12, 19, 14);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS83','CSE8C', 19, 15, 20);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS84','CSE8C', 20, 16, 19);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS85','CSE8C', 15, 15, 12);
```

SELECT * FROM STUDENT;

```
SQL> SELECT * FROM STUDENT1;

USN         SNAME                     ADDRESS                       PHONE G
----------  ------------------------- ------------------------- ---------- -
1RN13CS020 AKSHAY                    BELAGAVI                  8877881122 M
1RN13CS062 SANDHYA                   BENGALURU                 7722829912 F
1RN13CS091 TEESHA                    BENGALURU                 7712312312 F
1RN13CS066 SUPRIYA                   MANGALURU                 8877881122 F
1RN14CS010 ABHAY                     BENGALURU                 9900211201 M
1RN14CS032 BHASKAR                   BENGALURU                 9923211099 M
1RN15CS011 AJAY                      TUMKUR                    9845091341 M
1RN15CS029 CHITRA                    DAVANGERE                 7696772121 F
1RN15CS045 JEEVA                     BELLARY                   9944850121 M
1RN15CS091 SANTOSH                   MANGALURU                 8812332201 M
1RN16CS045 ISMAIL                    KALBURGI                  9900232201 M
1RN16CS088 SAMEERA                   SHIMOGA                   9905542212 F
1RN16CS122 VINAYAKA                  CHIKAMAGALUR              8800880011 M
1RN14CS025 ASMI                      BENGALURU                 7894737377 F
```

SELECT * FROM SEMSEC;

```
SQL> SELECT * FROM SEMSEC;

SSID         SEM S
----- ---------- -
CSE8A          8 A
CSE8B          8 B
CSE8C          8 C
CSE7A          7 A
CSE7B          7 B
CSE7C          7 C
CSE6A          6 A
CSE6B          6 B
CSE6C          6 C
CSE5A          5 A
CSE5B          5 B
CSE5C          5 C
CSE4A          4 A
CSE4B          4 B
CSE4C          4 C
CSE3A          3 A
CSE3B          3 B
CSE3C          3 C
CSE2A          2 A
CSE2C          2 C
CSE2B          2 B
CSE1A          1 A
CSE1B          1 B
CSE1C          1 C
```

SELECT * FROM CLASS;

```
SQL> SELECT * FROM CLASS;

USN        SSID
---------- -----
1RN13CS020 CSE8A
1RN13CS062 CSE8A
1RN13CS066 CSE8B
1RN13CS091 CSE8C
1RN14CS010 CSE7A
1RN14CS025 CSE7A
1RN14CS032 CSE7A
1RN15CS011 CSE4A
1RN15CS029 CSE4A
1RN15CS045 CSE4B
1RN15CS091 CSE4C
1RN16CS045 CSE3A
1RN16CS088 CSE3B
1RN16CS122 CSE3C

14 rows selected.
```

SELECT * FROM SUBJECT;

SUBCODE	TITLE	SEM	CREDITS
10CS81	ACA	8	4
10CS82	SSM	8	4
10CS83	NM	8	4
10CS84	CC	8	4
10CS85	PW	8	4
10CS71	OOAD	7	4
10CS72	ECS	7	4
10CS73	PTW	7	4
10CS74	DWDM	7	4
10CS75	JAVA	7	4
10CS76	SAN	7	4
15CS51	ME	5	4
15CS52	CN	5	4
15CS53	DBMS	5	4
15CS54	ATC	5	4
15CS55	JAVA	5	3
15CS56	AI	5	3
15CS41	M4	4	4
15CS42	SE	4	4
15CS43	DAA	4	4
15CS44	MPMC	4	4
15CS45	OOC	4	3
15CS46	DC	4	3
15CS31	M3	3	4
15CS32	ADE	3	4
15CS33	DSA	3	4
15CS34	CO	3	4
15CS35	USP	3	3
15CS36	DMS	3	3

SELECT * FROM IAMARKS;

```
SQL> SELECT * FROM IAMARKS;
```

USN	SUBCODE	SSID	TEST1	TEST2	TEST3	FINALIA
1RN13CS091	10CS81	CSE8C	15	16	18	
1RN13CS091	10CS82	CSE8C	12	19	14	
1RN13CS091	10CS83	CSE8C	19	15	20	
1RN13CS091	10CS84	CSE8C	20	16	19	
1RN13CS091	10CS85	CSE8C	15	15	12	

Queries:

1. **List all the student details studying in fourth semester 'C'section.**

```
SELECT S.*, SS.SEM, SS.SEC
 FROM STUDENT S, SEMSEC SS, CLASS C
 WHERE S.USN = C.USN AND
 SS.SSID = C.SSID AND
 SS.SEM = 4 AND
```

SS.SEc=’C’;

USN	SNAME	ADDRESS	PHONE	G	SEM	S
1RN15CS091	SANTOSH	MANGALURU	8812332201	M	4	C

2. Compute the total number of male and female students in each semester and ineach section.

```
SELECT SS.SEM, SS.SEC, S.GENDER, COUNT (S.GENDER) AS COUNT
FROM STUDENT S, SEMSEC SS, CLASS C
WHERES.USN = C.USN AND
SS.SSID = C.SSID
GROUP BY SS.SEM, SS.SEC, S.GENDER
ORDER BY SEM;
```

SEM	S	G	COUNT
3	A	M	1
3	B	F	1
3	C	M	1
4	A	F	1
4	A	M	1
4	B	M	1
4	C	M	1
7	A	F	1
7	A	M	2
8	A	F	1
8	A	M	1
8	B	F	1
8	C	F	1

3. Create a view of Test1 marks of student USN ‘1BI15CS101’ in allsubjects.

```
CREATE VIEW STU_TEST1_MARKS_VIEW
AS
SELECT TEST1, SUBCODE
FROM IAMARKS
WHERE USN = '1RN13CS091';
```

TEST1	SUBCODE
15	10CS81
12	10CS82
19	10CS83
20	10CS84
15	10CS85

4. Calculate the FinalIA (average of best two test marks) and update the corresponding table for all students.

```
  CREATE OR REPLACE PROCEDURE AVGMARKS
  IS
  CURSOR C_IAMARKS IS
SELECT GREATEST(TEST1, TEST2) AS A, GREATEST(TEST1,TEST3) AS B,
GREATEST(TEST3,TEST2) AS C
FROM IAMARKS
WHERE FINALIA IS NULL
FOR UPDATE;

  C_A NUMBER;
  C_B NUMBER;
  C_C NUMBER;
  C_SM NUMBER;
  C_AV NUMBER;

BEGIN
  OPEN C_IAMARKS;
  LOOP
  FETCH C_IAMARKS INTO C_A, C_B, C_C;
    EXIT WHEN C_IAMARKS%NOTFOUND;
    DBMS_OUTPUT.PUT_LINE(C_A || ' ' || C_B || ' ' || C_C);
    IF (C_A != C_B) THEN
 C_SM:=C_A+C_B;
    ELSE
 C_SM:=C_A+C_C;
    END IF;

    C_AV:=C_SM/2;
    DBMS_OUTPUT.PUT_LINE('SUM = '||C_SM);
    DBMS_OUTPUT.PUT_LINE('AVERAGE = '||C_AV);
    UPDATE IAMARKS SET FINALIA=C_AV  WHERE CURRENT OF C_IAMARKS;

  END LOOP;
  CLOSE C_IAMARKS;
END;
/
```

Note: Before execution of PL/SQL procedure, IAMARKS table contents are:

SELECT * FROM IAMARKS;

```
SQL> SELECT * FROM IAMARKS;

USN         SUBCODE  SSID       TEST1      TEST2      TEST3    FINALIA
----------- -------- ----- ---------- ---------- ---------- ----------
1RN13CS091 10CS81   CSE8C          15         16         18
1RN13CS091 10CS82   CSE8C          12         19         14
1RN13CS091 10CS83   CSE8C          19         15         20
1RN13CS091 10CS84   CSE8C          20         16         19
1RN13CS091 10CS85   CSE8C          15         15         12
```

Below SQL code is to invoke the PL/SQL stored procedure from the command line:

```
BEGIN
AVGMARKS;
END;
```

```
SQL> select * from IAMARks;

USN         SUBCODE  SSID       TEST1      TEST2      TEST3    FINALIA
----------- -------- ----- ---------- ---------- ---------- ----------
1RN13CS091 10CS81   CSE8C          15         16         18         17
1RN13CS091 10CS82   CSE8C          12         19         14         17
1RN13CS091 10CS83   CSE8C          19         15         20         20
1RN13CS091 10CS84   CSE8C          20         16         19         20
1RN13CS091 10CS85   CSE8C          15         15         12         15
```

5. Categorize students based on the followingcriterion:
If FinalIA = 17 to 20 then CAT =‘Outstanding’
If FinalIA = 12 to 16 then CAT = ‘Average’
If FinalIA< 12 then CAT = ‘Weak’
Give these details only for 8th semester A, B, and C section students.

```
SELECT S.USN,S.SNAME,S.ADDRESS,S.PHONE,S.GENDER,
    (CASE
      WHEN IA.FINALIA BETWEEN 17 AND 20 THEN'OUTSTANDING'
      WHEN IA.FINALIA BETWEEN 12 AND 16 THEN 'AVERAGE'
      ELSE'WEAK'
    END) AS CAT
FROM STUDENT S, SEMSEC SS, IAMARKS IA, SUBJECT SUB
WHERE S.USN = IA.USN AND
SS.SSID = IA.SSID AND
SUB.SUBCODE = IA.SUBCODE AND
SUB.SEM = 8;
```

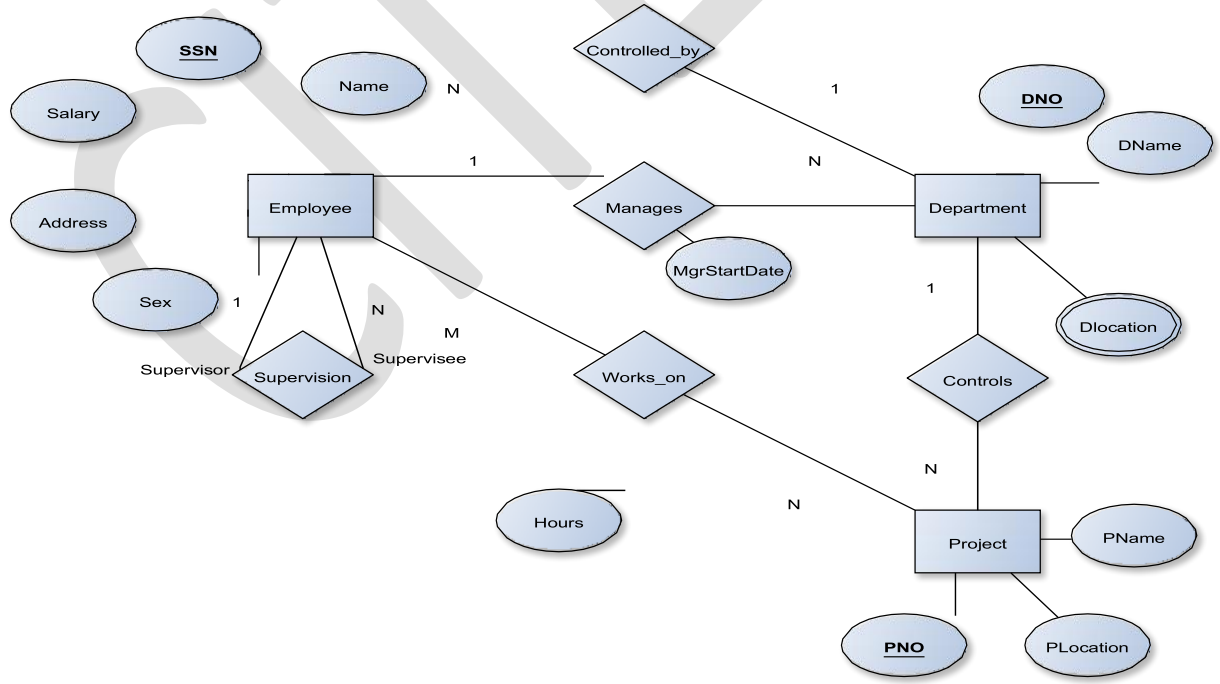
USN	SNAME	ADDRESS	PHONE	G	CAT
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	Average

E. Consider the schema for CompanyDatabase:

EMPLOYEE (*SSN, Name, Address, Sex, Salary, SuperSSN, DNo*)
DEPARTMENT (*DNo, DName, MgrSSN, MgrStartDate*)
DLOCATION (*DNo,DLoc*)
PROJECT (*PNo, PName, PLocation, DNo*)
WORKS_ON (*SSN, PNo, Hours*)
Write SQL queries to

1. **Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls theproject.**
2. **Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percentraise.**
3. **Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department**
4. **Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator). For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs.6,00,000.**

Entity-Relationship Diagram



Schema Diagram

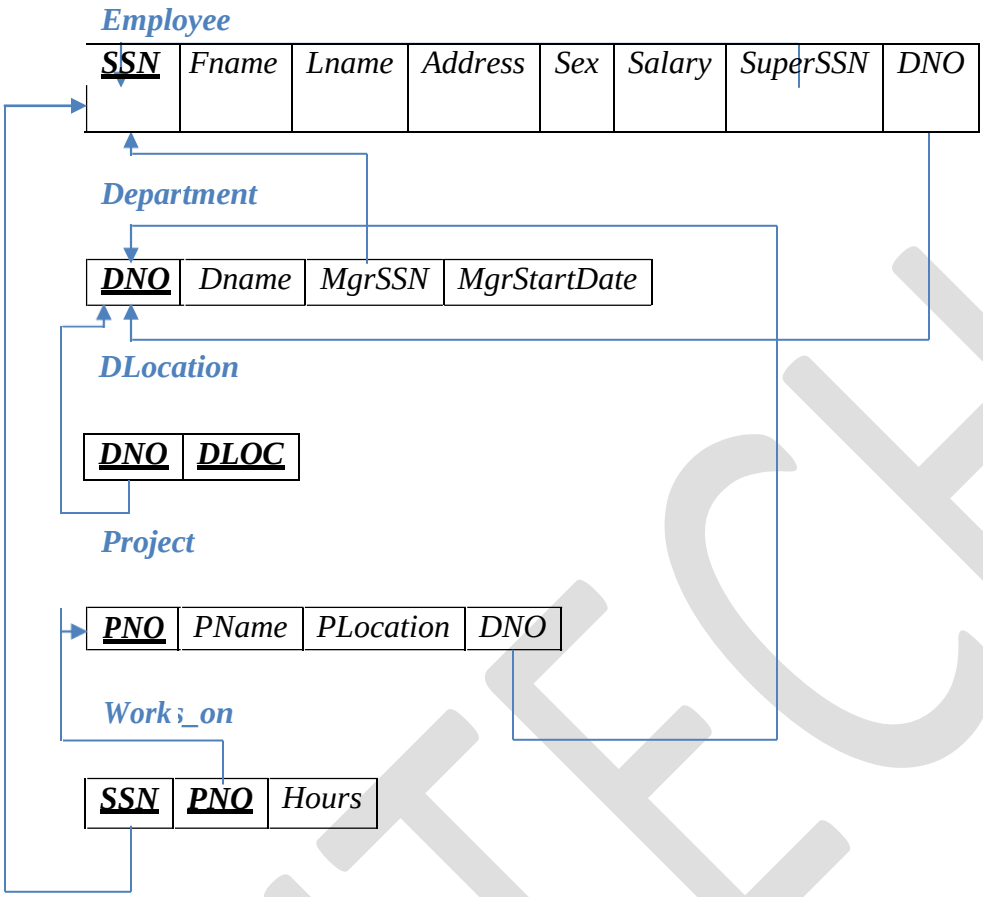


Table Creation

```
CREATE TABLE DEPARTMENT
(DNO VARCHAR2 (20) PRIMARY KEY,
DNAME VARCHAR2 (20),
MGRSTARTDATE DATE);

CREATE TABLE EMPLOYEE
(SSN VARCHAR2 (20) PRIMARY KEY,
FNAME VARCHAR2 (20),
LNAME VARCHAR2 (20),
ADDRESS VARCHAR2 (20),
SEX CHAR (1),
SALARY INTEGER,
SUPERSSN REFERENCES EMPLOYEE (SSN),
DNO REFERENCES DEPARTMENT (DNO));
```

NOTE: Once DEPARTMENT and EMPLOYEE tables are created we must alter department table to add foreign constraint MGRSSN using sql command

ALTER TABLE DEPARTMENT
ADD MGRSSN REFERENCES EMPLOYEE (SSN);

CREATE TABLE DLOCATION
(DLOC VARCHAR2 (20),
DNO REFERENCES DEPARTMENT (DNO),
PRIMARY KEY (DNO, DLOC));

CREATE TABLE PROJECT
(PNO INTEGER PRIMARY KEY,
PNAME VARCHAR2(20),
PLOCATION VARCHAR2 (20),
DNO REFERENCES DEPARTMENT (DNO));

CREATE TABLE WORKS_ON
(HOURS NUMBER (2),
SSN REFERENCES EMPLOYEE (SSN),
PNO REFERENCES PROJECT(PNO),
PRIMARY KEY (SSN, PNO));

Table Descriptions

DESC EMPLOYEE;

```
SQL> DESC EMPLOYEE;
 Name
 -----------------------------------------------------------------
 SSN
 FNAME
 LNAME
 ADDRESS
 SEX
 SALARY
 SUPERSSN
 DNO
```

DESC DEPARTMENT;

```
SQL> DESC DEPARTMENT;
 Name
 -----------------------------------------------------
 DNO
 DNAME
 MGRSTARTDATE
 MGRSSN
```

DESC DLOCATION;

```
SQL> DESC DLOCATION;
 Name
 -------------------------
 DLOC
 DNO
```

DESC PROJECT;

```
SQL> DESC PROJECT;
 Name
 ------------------------
 PNO
 PNAME
 PLOCATION
 DNO
```

DESC WORKS_ON;

```
SQL> DESC WORKS_ON;
 Name
 ----------------------------------------------
 HOURS
 SSN
 PNO
```

Insertion of values to tables

INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES (‘RNSECE01’,’JOHN’,’SCOTT’,’BANGALORE’,’M’, 450000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES (‘RNSCSE01’,’JAMES’,’SMITH’,’BANGALORE’,’M’, 500000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES (‘RNSCSE02’,’HEARN’,’BAKER’,’BANGALORE’,’M’, 700000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES (‘RNSCSE03’,’EDWARD’,’SCOTT’,’MYSORE’,’M’, 500000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES (‘RNSCSE04’,’PAVAN’,’HEGDE’,’MANGALORE’,’M’, 650000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES (‘RNSCSE05’,’GIRISH’,’MALYA’,’MYSORE’,’M’, 450000);

```
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES
('RNSCSE06','NEHA','SN','BANGALORE','F', 800000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES
('RNSACC01','AHANA','K','MANGALORE','F', 350000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES
('RNSACC02','SANTHOSH','KUMAR','MANGALORE','M', 300000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES
('RNSISE01','VEENA','M','MYSORE','M', 600000);
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY) VALUES
('RNSIT01','NAGESH','HR','BANGALORE','M', 500000);


INSERT INTO DEPARTMENT VALUES ('1','ACCOUNTS','01-JAN-01','RNSACC02');
INSERT INTO DEPARTMENT VALUES ('2','IT','01-AUG-16','RNSIT01');
INSERT INTO DEPARTMENT VALUES ('3','ECE','01-JUN-08','RNSECE01');
INSERT INTO DEPARTMENT VALUES ('4','ISE','01-AUG-15','RNSISE01');
INSERT INTO DEPARTMENT VALUES ('5','CSE','01-JUN-02','RNSCSE05');
```

Note: update entries of employee table to fill missing fields SUPERSSN and DNO

```
UPDATE EMPLOYEE SET
SUPERSSN=NULL, DNO='3'
WHERE SSN='RNSECE01';

UPDATE EMPLOYEE SET
SUPERSSN='RNSCSE02', DNO='5'
WHERE SSN='RNSCSE01';

UPDATE EMPLOYEE SET
SUPERSSN='RNSCSE03', DNO='5'
WHERE SSN='RNSCSE02';

UPDATE EMPLOYEE SET
SUPERSSN='RNSCSE04', DNO='5'
WHERE SSN='RNSCSE03';

UPDATE EMPLOYEE SET
DNO='5', SUPERSSN='RNSCSE05'
WHERE SSN='RNSCSE04';
```

```
UPDATE EMPLOYEE SET
DNO=’5’, SUPERSSN=’RNSCSE06’
WHERE SSN=’RNSCSE05’;

UPDATE EMPLOYEE SET
DNO=’5’, SUPERSSN=NULL
WHERE SSN=’RNSCSE06’;

UPDATE EMPLOYEE SET
DNO=’1’, SUPERSSN=’RNSACC02’
WHERESSN=’RNSACC01’;

UPDATE EMPLOYEE SET
DNO=’1’, SUPERSSN=NULL
WHERE SSN=’RNSACC02’;

UPDATE EMPLOYEE SET
DNO=’4’, SUPERSSN=NULL
WHERE SSN=’RNSISE01’;

UPDATE EMPLOYEE SET
DNO=’2’, SUPERSSN=NULL
WHERE SSN=’RNSIT01’;

INSERT INTO DLOCATION VALUES (’BANGALORE’, ‘1’);
INSERT INTO DLOCATION VALUES (’BANGALORE’, ‘2’);
INSERT INTO DLOCATION VALUES (’BANGALORE’, ‘3’);
INSERT INTO DLOCATION VALUES (’MANGALORE’, ‘4’);
INSERT INTO DLOCATION VALUES (’MANGALORE’, ‘5’);

INSERT INTO PROJECT VALUES (100,’IOT’,’BANGALORE’,’5’);
INSERT INTO PROJECT VALUES (101,’CLOUD’,’BANGALORE’,’5’);
INSERT INTO PROJECT VALUES (102,’BIGDATA’,’BANGALORE’,’5’);
INSERT INTO PROJECT VALUES (103,’SENSORS’,’BANGALORE’,’3’);
INSERT INTO PROJECT VALUES (104,’BANK MANAGEMENT’,’BANGALORE’,’1’);
INSERT INTO PROJECT VALUES (105,’SALARY MANAGEMENT’,’BANGALORE’,’1’);
INSERT INTO PROJECT VALUES (106,’OPENSTACK’,’BANGALORE’,’4’);
INSERT INTO PROJECT VALUES (107,’SMART CITY’,’BANGALORE’,’2’);
```

INSERT INTO WORKS_ON VALUES (4, 'RNSCSE01', 100);
INSERT INTO WORKS_ON VALUES (6, 'RNSCSE01', 101);
INSERT INTO WORKS_ON VALUES (8, 'RNSCSE01', 102);
INSERT INTO WORKS_ON VALUES (10, 'RNSCSE02', 100);
INSERT INTO WORKS_ON VALUES (3, 'RNSCSE04', 100);
INSERT INTO WORKS_ON VALUES (4, 'RNSCSE05', 101);
INSERT INTO WORKS_ON VALUES (5, 'RNSCSE06', 102);
INSERT INTO WORKS_ON VALUES (6, 'RNSCSE03', 102);
INSERT INTO WORKS_ON VALUES (7, 'RNSECE01', 103);
INSERT INTO WORKS_ON VALUES (5, 'RNSACC01', 104);
INSERT INTO WORKS_ON VALUES (6, 'RNSACC02', 105);
INSERT INTO WORKS_ON VALUES (4, 'RNSISE01', 106);
INSERT INTO WORKS_ON VALUES (10, 'RNSIT01', 107);

SELECT * FROM EMPLOYEE;

SSN	FNAME	LNAME	ADDRESS	S	SALARY	SUPERSSN	DNO
RNSECE01	JOHN	SCOTT	BANGALORE	M	450000		3
RNSCSE01	JAMES	SMITH	BANGALORE	M	500000	RNSCSE02	5
RNSCSE02	HEARN	BAKER	BANGALORE	M	700000	RNSCSE03	5
RNSCSE03	EDWARD	SCOTT	MYSORE	M	500000	RNSCSE04	5
RNSCSE04	PAVAN	HEGDE	MANGALORE	M	650000	RNSCSE05	5
RNSCSE05	GIRISH	MALYA	MYSORE	M	450000	RNSCSE06	5
RNSCSE06	NEHA	SN	BANGALORE	F	800000		5
RNSACC01	AHANA	K	MANGALORE	F	350000	RNSACC02	1
RNSACC02	SANTHOSH	KUMAR	MANGALORE	M	300000		1
RNSISE01	VEENA	M	MYSORE	M	600000		4
RNSIT01	NAGESH	HR	BANGALORE	M	500000		2

SELECT * FROM DEPARTMENT;

```
SQL> SELECT * FROM DEPARTMENT;
```

DNO	DNAME	MGRSTARTD	MGRSSN
1	ACCOUNTS	01-JAN-01	RNSACC02
2	IT	01-AUG-16	RNSIT01
3	ECE	01-JUN-08	RNSECE01
4	ISE	01-AUG-15	RNSISE01
5	CSE	01-JUN-02	RNSCSE05

SELECT * FROM DLOCATION;

DLOC	DNO
BANGALORE	1
BANGALORE	2
BANGALORE	3
MANGALORE	4
MANGALORE	5

SELECT * FROM PROJECT;

PNO	PNAME	PLOCATION	DNO
100	IOT	BANGALORE	5
101	CLOUD	BANGALORE	5
102	BIGDATA	BANGALORE	5
103	SENSORS	BANGALORE	3
104	BANK MANAGEMENT	BANGALORE	1
105	SALARY MANAGEMENT	BANGALORE	1
106	OPENSTACK	BANGALORE	4
107	SMART CITY	BANGALORE	2

SELECT * FROM WORKS_ON;

HOURS	SSN	PNO
4	RNSCSE01	100
6	RNSCSE01	101
8	RNSCSE01	102
10	RNSCSE02	100
3	RNSCSE04	100
4	RNSCSE05	101
5	RNSCSE06	102
6	RNSCSE03	102
7	RNSECE01	103
5	RNSACC01	104
6	RNSACC02	105
4	RNSISE01	106
10	RNSIT01	107

Queries:

1. **Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controlsthe project.**

```
(SELECT DISTINCT P.PNO
FROM PROJECT P, DEPARTMENT D, EMPLOYEE E
WHERE E.DNO=D.DNO
AND D.MGRSSN=E.SSN
AND E.LNAME='SCOTT')
UNION
(SELECT DISTINCT P1.PNO
FROM PROJECT P1, WORKS_ON W, EMPLOYEE E1
WHERE P1.PNO=W.PNO
AND E1.SSN=W.SSN
AND E1.LNAME='SCOTT');
```

```
     PNO
--------
     100
     101
     102
     103
     104
     105
     106
     107
```

2. Show the resulting salaries if every employee working on the 'IoT' project is given a10 percentraise.

```
SELECT E.FNAME, E.LNAME, 1.1*E.SALARY AS INCR_SAL
FROM EMPLOYEE E, WORKS_ON W, PROJECT P
WHERE E.SSN=W.SSN
AND W.PNO=P.PNO
AND P.PNAME='IOT';
```

```
FNAME                LNAME                INCR_SAL
-------------------- -------------------- ----------
JAMES                SMITH                   550000
HEARN                BAKER                   770000
PAVAN                HEGDE                   715000
```

3. Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in thisdepartment

```
SELECT SUM (E.SALARY), MAX (E.SALARY), MIN (E.SALARY), AVG
(E.SALARY)
FROM EMPLOYEE E, DEPARTMENT D
WHERE E.DNO=D.DNO
AND D.DNAME='ACCOUNTS';
```

```
SUM(E.SALARY) MAX(E.SALARY) MIN(E.SALARY) AVG(E.SALARY)
------------- ------------- ------------- -------------
       650000        350000        300000        325000
```

4. Retrieve the name of each employee who works on all the projects Controlled by department number 5 (use NOT EXISTSoperator).

```
SELECT E.FNAME, E.LNAME
FROM EMPLOYEE E
WHERE NOT EXISTS((SELECT PNO
                  FROM PROJECT
```

```
WHERE DNO=’5’)
MINUS (SELECT PNO
FROM WORKS_ON
WHERE E.SSN=SSN));
```

FNAME	LNAME
JAMES	SMITH

5. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.

```
SELECT D.DNO, COUNT (*)
FROM DEPARTMENT D, EMPLOYEE E
WHERE D.DNO=E.DNO
AND E.SALARY>600000
AND D.DNO IN (SELECT E1.DNO
        FROM EMPLOYEE E1
        GROUP BY E1.DNO
        HAVING COUNT (*)>5)
GROUP BY D.DNO;
```

DNO	COUNT(*)
5	3

Content Beyond Syllabus

Question 1: INSURANCE DATABASE

Table creation :

```
SQL>  create table PERSON (
        driver_idvarchar2(10) primary key,
        name varchar2(20),
        address varchar2(30)
        );

SQL>  create table CAR (
        regno varchar2(10) primary key,
        model varchar2(20),
        year number(4)
        );

SQL> create table ACCIDENT (
        report_no number(4) primary key,
        dt date,
        location varchar2(20)
        );

SQL> create table OWNS (
        driver_idreferences PERSON(driver_id),
        regnoreferences CAR(regno)
        );

SQL> create table PARTICIPATED (
        driver_idreferences PERSON(driver_id),
        regnoreferences CAR(regno),
        report_numberreferences ACCIDENT(report_no),
        damage_amount number(7,2)
        );
```

Table description :

SQL>desc person;

Name	Null?	Type
driver_id	not null	varchar2(10)
name		varchar2(20)
address		varchar2(30)

SQL>desc car;

```
Name          Null?          Type
 ------------  -------------  ----------------------------
regno          not null       varchar2(10)
model                         varchar2(20)
year                          number(4)
```

SQL>desc accident;

```
Name              Null?          Type
 ----------------- ------------- -------------
report_no         not null        number(4)
dt                                date
location                          varchar2(20)
```

SQL>desc owns;

```
Name             Null?     Type
 ---------------- --------- ------------------
driver_id                   varchar2(10)
regno                       varchar2(10)
```

SQL>desc participated;

```
Name                      Null?     Type
 ------------------------ --------  ------------------
driver_idvarchar2(10)
regno                               varchar2(10)
report_number                       number(4)
damage_amount                       number(7,2)
```

Insert command:
Table: PERSON
insert into PERSON **values** ('mca10','shivu','kottur');

Table: CAR
insert into CAR **values** ('ab10','maruti',1995);

Table: ACCIDENT
insert into ACCIDENT **values** (1234,'11-MAR-96','bellary');

Table: OWNS
insert into OWNS **values** ('mca10','ab10');

Table: PARTICIPATED
insert into PARTICIPATED **values** ('mca10','ab10',1234,10000);

Select command:

SQL> select * from person;

```
DRIVER_ID  NAME          ADDRESS
---------- ------------- --------------------------
mca10shivukottur
mca15harshadurga
mca20anuragraipur
mca25sachinbelgaum
mca30shaahidassam
```

SQL> select * from accident;

```
 REPORT_NO    DT              LOCATION
---------- ------------ --------------------
      1234    11-MAR-96    bellary
      1244    23-NOV-98    davangere
      1245    21-JUN-99    tumkur
      1377    17-JUL-02    hubli
      1543    15-FEB-03    belgaum
      1388    15-OCT-01    mysore
```

SQL> select * from car;

```
REGNO      MODEL      YEAR
---------- ------------ ----------
ab10maruti          1995
     ab15honda          1998
     ab20       ford            1999
     ab25       lancer          2000
     ab30honda          1996
```

SQL> select * from owns;

```
     DRIVER_ID   REGNO
     ---------- ----------
     mca10       ab10
     mca15       ab15
     mca20       ab20
     mca25       ab25
     mca30       ab30
```

SQL> select * from participated;

DRIVER_ID	REGNO	REPORT_NUMBER	DAMAGE_AMOUNT
mca10	ab10	1234	10000
mca15	ab15	1244	15000
mca20	ab20	1377	8000
mca25	ab25	1245	25000
mca30	ab30	1543	10000

QUERIES:

QUERY 1.1: Find the total number of people who owned car that were involved in accident in 2002.

SQL> select count(distinct p.driver_id) **from** participated p,accident a, owns o **where** p.regno=o.regno **and** a.report_no=p.report_number **and** dt **between** '01-jan-2002' **and** '31-dec-2002';

COUNT(DISTINCTP.DRIVER_ID)
1

QUERY 1.2: Find the number of accidents in which car belonging to a specific model were involved.

SQL> select count(regno) **from** participated **where** regno **in** (**select** regno **From** car **where** model='honda');

COUNT(REGNO)
2

Question 2: DATABASE FOR BANKING ENTERPRISE

Table creation :

```
create table BRANCH (
 branch_name varchar2(10) primary key,
 branch_city varchar2(10),
 assets number(10,2)
);

create table ACCOUNT (
 accno number(8) primary key,
 branch_name references BRANCH(branch_name),
 balance number(10,3)
);

create table CUSTOMERB (
 cust_name varchar2(15) primary key,
 cust_street varchar2(10),
 cust_city varchar2(10)
);

create table DEPOSITOR (
 customer_name references CUSTOMERB(cust_name),
 accno references ACCOUNT(accno) ON DELETE CASCADE
);

create table LOAN (
 loan_no number(8) primary key,
 branch_name references BRANCH(branch_name),
 amount number(10,3)
);

create table BORROWER (
 cust_name varchar2(15) references CUSTOMERB(cust_name),
 loan_no number(8) references LOAN(loan_no)
);
```

Table description :

```
SQL> desc branch;
 Name                      Null?    Type
 ------------------------- -------- ----------------------------
 branch_name               not null varchar2(10)
 branch_city                        varchar2(10)
 assets                             number(10,2)
```

SQL> desc account;

Name	Null?	Type
accno	not null	number(8)
branch_name		varchar2(10)
balance		number(10,3)

SQL> desc depositor;

Name	Null?	Type
customer_name		varchar2(15)
accno		number(8)

SQL> desc customerb;

Name	Null?	Type
cust_name	not null	varchar2(15)
cust_street		varchar2(10)
cust_city		varchar2(10)

SQL> desc loan;

Name	Null?	Type
loan_no	not null	number(8)
branch_name		varchar2(10)
amount		number(10,3)

SQL> desc borrower;

Name	Null?	Type
cust_name		varchar2(15)
loan_no		number(8)

Insert command:

Table: BRANCH

SQL> insert into BRANCH **values** ('main','belgaum',33000)
SQL> insert into BRANCH **values** ('sub1','tumkur',20000)
SQL> insert into BRANCH **values** ('sub2','tumkur',50000)
SQL> insert into BRANCH **values** ('sub3','hubli',45000)

SQL> insert into BRANCH **values** ('sub4','dharwad',60000)

Table: ACCOUNT

SQL> insert into ACCOUNT **values** (111,'main',12000)
SQL> insert into ACCOUNT **values** (222,'sub1',15000)
SQL> insert into ACCOUNT **values** (333,'sub2',10000)
SQL> insert into ACCOUNT **values** (444,'sub3',4500)
SQL> insert into ACCOUNT **values** (555,'sub4',9000)
SQL> insert into ACCOUNT **values** (666,'main',11000)
SQL> insert into ACCOUNT **values**(777,'sub2',11000)

Table: DEPOSITOR

SQL> insert into DEPOSITOR **values** ('john',111);
SQL> insert into DEPOSITOR **values** ('jack',444);
SQL> insert into DEPOSITOR **values** ('jill',555);
SQL> insert into DEPOSITOR **values** ('john',666);
SQL> insert into DEPOSITOR **values** ('john',777);

Table: CUSTOMERB

SQL> insert into CUSTOMERB **values** ('johny',10,'kottur');
SQL> insert into CUSTOMERB **values** ('dude',15,'durga');
SQL> insert into CUSTOMERB **values** ('john',20,'tumkur');
SQL> insert into CUSTOMERB **values** ('jack',25,'belgaum');
SQL> insert into CUSTOMERB **values** ('jill',30,'tumkur');

Table: LOAN

SQL> insert into LOAN **values** (1,'main',12000);
SQL> insert into LOAN **values** (2,'sub1',10000);
SQL> insert into LOAN **values** (3,'sub1',15000);
SQL> insert into LOAN **values** (4,'sub2',10000);
SQL> insert into LOAN **values** (5,'sub3',8000);

Table: BORROWER

SQL> insert into BORROWER **values** ('john',1);
SQL> insert into BORROWER **values** ('dude',2);
SQL> insert into BORROWER **values** ('dude',3);
SQL> insert into BORROWER **values** ('jill',4);
SQL> insert into BORROWER **values** ('jack',5);

Select command:

SQL> select * from branch;

BRANCH_NAME	BRANCH_CITY	ASSETS
main	belgaum	33000
sub1	tumkur	20000
sub2	tumkur	50000

sub3	hubli	45000
sub4	dharwad	60000

SQL> select * from account;

ACCNO	BRANCH_NAME	BALANCE
111	sub1	12000
222	sub1	15000
333	sub2	10000
444	sub3	4500
555	sub1	9000
666	main	11000
777	sub2	11000

SQL> select * from customerb;

CUST_NAME	CUST_STREET	CUST_CITY
johny	10	kottur
dude	15	durga
john	20	tumkur
jack	25	belgaum
jill	30	tumkur

SQL> select * from depositor;

CUSTOMER_NAME	ACCNO
john	111
jack	444
jill	555
john	666
john	777

SQL> select * from loan;

LOAN_NO	BRANCH_NAME	AMOUNT
1	main	12000
2	sub1	10000
3	sub1	15000
4	sub2	10000
5	sub3	8000

SQL> select * from borrower;

CUST_NAME	LOAN_NO
john	1
dude	2
dude	3
jill	4
jack	5

QUERIES:

Query 1: Find all the customers who have at least two accounts at the Main branch.

```
SQL> select customer_name from  depositor d, account a
     where d.accno=a.accno and branch_name = '& branch_name'
     group by customer_name having count(customer_name) > 1;
```

```
CUSTOMER_NAME
---------------
john
```

Query 2: Demonstrate how you delete all account tuples at every branch located in a specific city.

Before the deletion:

SQL> select * from branch;

BRANCH_NAME	BRANCH_CITY	ASSETS
main	belgaum	33000
sub1	tumkur	20000
sub2	tumkur	50000
sub3	hubli	45000
sub4	dharwad	60000

SQL> select * from account;

ACCNO	BRANCH_NAME	BALANCE
111	sub1	12000
222	sub1	15000
333	sub2	10000
444	sub3	4500
555	sub1	9000
666	main	11000
777	sub2	11000

SQL> delete account **where** branch_name **in** (**select** branch_name **from** branch
where branch_city='&branch_city');

1 row deleted.

SQL> select * from account;

ACCNO	BRANCH_NAME	BALANCE
111	sub1	12000
222	sub1	15000
333	sub2	10000
555	sub1	9000
666	main	11000
777	sub2	11000