DATABASE MANAGEMENT AND SYSTEMS LAB

PRACTICAL-2

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ROLL: 69

BATCH: A4

AIM: To demonstrate SQL queries involving insertions, deletions and updating in a multi-relation environment. To implement various joins and set operations and SQL queries on given schema.

SQL> select * from Course;

CID	CNAME	CREDIT
101	DBMS	4
102	OOPS	3
103	OS	5
104	CN	2
105	CG	1

SQL> select * from participant;

PID	PNAME	G	CID
6666	Sanjana	F	101
9999	Shilpa	F	102
8888	Pranav	M	103
1001	Ayush	M	105
7777	AKSHAT	M	
1111	VEDANT	M	105

```
2222 KAPIL                M       103
4444 VARUN                M       102
3333 ADARSH               M       101
1234 Rohan                M
```

10 rows selected.

```
SQL> SELECT PNAME || ' takes course in ' || CNAME || ' of ' || CREDIT || ' credits.'
  2  FROM COURSE C JOIN PARTICIPANT P
  3  ON C.CID = P.CID;
```

```
PNAME||'TAKESCOURSEIN'||CNAME||'OF'||CREDIT||'CREDITS.'
--------------------------------------------------------------------------------
ADARSH takes course in DBMS of 4 credits.
Sanjana takes course in DBMS of 4 credits.
VARUN takes course in OOPS of 3 credits.
Shilpa takes course in OOPS of 3 credits.
Pranav takes course in OS of 5 credits.
KAPIL takes course in OS of 5 credits.
VEDANT takes course in CG of 1 credits.
Ayush takes course in CG of 1 credits.
```

8 rows selected.

```
SQL> SELECT CONCAT(PNAME, CONCAT(' takes course in ',
  2  CONCAT( CNAME, CONCAT(' of ', CONCAT(CREDIT, ' credits.')))))
  3  FROM COURSE C JOIN PARTICIPANT P
  4  ON C.CID = P.CID;
```

```
CONCAT(PNAME,CONCAT('TAKESCOURSEIN',CONCAT(CNAME,CONCAT('OF',CONCAT(CREDIT,'CRED
--------------------------------------------------------------------------------
```

ADARSH takes course in DBMS of 4 credits.

Sanjana takes course in DBMS of 4 credits.

VARUN takes course in OOPS of 3 credits.

Shilpa takes course in OOPS of 3 credits.

Pranav takes course in OS of 5 credits.

KAPIL takes course in OS of 5 credits.

VEDANT takes course in CG of 1 credits.

Ayush takes course in CG of 1 credits.

8 rows selected.

```
SQL> SELECT PNAME || ' takes course in ' || CNAME || ' of ' || CREDIT || ' credits.'
  2  AS "Participant --> Course"
  3  FROM COURSE C JOIN PARTICIPANT P
  4  ON C.CID = P.CID;
```

Participant --> Course

ADARSH takes course in DBMS of 4 credits.

Sanjana takes course in DBMS of 4 credits.

VARUN takes course in OOPS of 3 credits.

Shilpa takes course in OOPS of 3 credits.

Pranav takes course in OS of 5 credits.

KAPIL takes course in OS of 5 credits.

VEDANT takes course in CG of 1 credits.

Ayush takes course in CG of 1 credits.

8 rows selected.

```
SQL> set linesize 400;
```

//CREATE PARTICIPANT 1

```
SQL> CREATE TABLE PARTICIPANT_1
  2  AS SELECT * FROM PARTICIPANT
  3  WHERE PID IN (1234,6666,8888,1001);
```

Table created.

//CREATE PARTICIPANT 2

```
SQL> CREATE TABLE PARTICIPANT_2
  2  AS SELECT * FROM PARTICIPANT
  3  WHERE PID IN (9999,6666,1001,7777,3333,4444,1111);
```

Table created.

```
SQL> SELECT * FROM PARTICIPANT_1;

       PID PNAME                G       CID
---------- ------------------------ - ----------
      1001 Ayush                M       105
      1234 Rohan                M
      6666 Sanjana              F       101
      8888 Pranav               M       103
```

```
SQL> SELECT * FROM PARTICIPANT_2;

       PID PNAME                G       CID
---------- ------------------------ - ----------
      1001 Ayush                M       105
      1111 VEDANT               M       105
      3333 ADARSH               M       101
      4444 VARUN                M       102
```

6666 Sanjana F 101

7777 AKSHAT M

9999 Shilpa F 102

7 rows selected.

//APPLY VARIOUS JOINS ON COURSE-PARTICIPANT SCHEMA

```
SQL> select *
  2  from course cross join participant;
```

CID	CNAME	CREDIT	PID	PNAME	G	CID
101	DBMS	4	6666	Sanjana	F	101
101	DBMS	4	9999	Shilpa	F	102
101	DBMS	4	8888	Pranav	M	103
101	DBMS	4	1001	Ayush	M	105
101	DBMS	4	7777	AKSHAT	M	
101	DBMS	4	1111	VEDANT	M	105
101	DBMS	4	2222	KAPIL	M	103
101	DBMS	4	4444	VARUN	M	102
101	DBMS	4	3333	ADARSH	M	101
101	DBMS	4	1234	Rohan	M	
102	OOPS	3	6666	Sanjana	F	101

CID	CNAME	CREDIT	PID	PNAME	G	CID
102	OOPS	3	9999	Shilpa	F	102
102	OOPS	3	8888	Pranav	M	103
102	OOPS	3	1001	Ayush	M	105
102	OOPS	3	7777	AKSHAT	M	
102	OOPS	3	1111	VEDANT	M	105

102 OOPS	3	2222 KAPIL	M	103	
102 OOPS	3	4444 VARUN	M	102	
102 OOPS	3	3333 ADARSH	M	101	
102 OOPS	3	1234 Rohan	M		
103 OS	5	6666 Sanjana	F	101	
103 OS	5	9999 Shilpa	F	102	

CID	CNAME	CREDIT	PID	PNAME	G	CID
103	OS	5	8888	Pranav	M	103
103	OS	5	1001	Ayush	M	105
103	OS	5	7777	AKSHAT	M	
103	OS	5	1111	VEDANT	M	105
103	OS	5	2222	KAPIL	M	103
103	OS	5	4444	VARUN	M	102
103	OS	5	3333	ADARSH	M	101
103	OS	5	1234	Rohan	M	
104	CN	2	6666	Sanjana	F	101
104	CN	2	9999	Shilpa	F	102
104	CN	2	8888	Pranav	M	103

CID	CNAME	CREDIT	PID	PNAME	G	CID
104	CN	2	1001	Ayush	M	105
104	CN	2	7777	AKSHAT	M	
104	CN	2	1111	VEDANT	M	105
104	CN	2	2222	KAPIL	M	103
104	CN	2	4444	VARUN	M	102
104	CN	2	3333	ADARSH	M	101
104	CN	2	1234	Rohan	M	
105	CG	1	6666	Sanjana	F	101

105 CG	1	9999 Shilpa	F	102	
105 CG	1	8888 Pranav	M	103	
105 CG	1	1001 Ayush	M	105	

CID	CNAME	CREDIT	PID	PNAME	G	CID
105	CG	1	7777	AKSHAT	M	
105	CG	1	1111	VEDANT	M	105
105	CG	1	2222	KAPIL	M	103
105	CG	1	4444	VARUN	M	102
105	CG	1	3333	ADARSH	M	101
105	CG	1	1234	Rohan	M	

50 rows selected.

```
SQL> select *
  2  from course c join participant p
  3  on c.cid=p.cid;
```

CID	CNAME	CREDIT	PID	PNAME	G	CID
101	DBMS	4	3333	ADARSH	M	101
101	DBMS	4	6666	Sanjana	F	101
102	OOPS	3	4444	VARUN	M	102
102	OOPS	3	9999	Shilpa	F	102
103	OS	5	8888	Pranav	M	103
103	OS	5	2222	KAPIL	M	103
105	CG	1	1111	VEDANT	M	105
105	CG	1	1001	Ayush	M	105

8 rows selected.

```
SQL> select *
  2  from course c natural join participant p;

      CID CNAME                      CREDIT       PID PNAME                G
---------- ------------------------------ ---------- ---------- ------------------------- -
      101 DBMS                            4       3333 ADARSH               M
      101 DBMS                            4       6666 Sanjana              F
      102 OOPS                            3       4444 VARUN                M
      102 OOPS                            3       9999 Shilpa               F
      103 OS                              5       8888 Pranav               M
      103 OS                              5       2222 KAPIL                M
      105 CG                              1       1111 VEDANT               M
      105 CG                              1       1001 Ayush                M

8 rows selected.

SQL> select *
  2  from course c left outer join participant p
  3  on c.cid=p.cid;

      CID CNAME                      CREDIT       PID PNAME                G       CID
---------- ------------------------------ ---------- ---------- ------------------------- - ----------
      101 DBMS                            4       3333 ADARSH               M       101
      101 DBMS                            4       6666 Sanjana              F       101
      102 OOPS                            3       4444 VARUN                M       102
      102 OOPS                            3       9999 Shilpa               F       102
      103 OS                              5       8888 Pranav               M       103
      103 OS                              5       2222 KAPIL                M       103
      104 CN                              2
      105 CG                              1       1111 VEDANT               M       105
```

```
105 CG                          1       1001 Ayush              M       105

9 rows selected.

SQL> select *
  2  from course c right outer join participant p
  3  on c.cid=p.cid;

     CID CNAME                       CREDIT       PID PNAME               G       CID
---------- ------------------------------ ---------- ---------- ------------------------- - ----------
     101 DBMS                         4       3333 ADARSH              M       101
     101 DBMS                         4       6666 Sanjana             F       101
     102 OOPS                         3       4444 VARUN               M       102
     102 OOPS                         3       9999 Shilpa              F       102
     103 OS                          5       2222 KAPIL               M       103
     103 OS                          5       8888 Pranav              M       103
     105 CG                          1       1111 VEDANT              M       105
     105 CG                          1       1001 Ayush               M       105
                                      1234 Rohan               M
                                      7777 AKSHAT              M

10 rows selected.

SQL> select *
  2  from course c full outer join participant p
  3  on c.cid=p.cid;

     CID CNAME                       CREDIT       PID PNAME               G       CID
---------- ------------------------------ ---------- ---------- ------------------------- - ----------
     101 DBMS                         4       6666 Sanjana             F       101
     102 OOPS                         3       9999 Shilpa              F       102
```

103 OS	5	8888 Pranav	M	103
105 CG	1	1001 Ayush	M	105
		7777 AKSHAT	M	
105 CG	1	1111 VEDANT	M	105
103 OS	5	2222 KAPIL	M	103
102 OOPS	3	4444 VARUN	M	102
101 DBMS	4	3333 ADARSH	M	101
		1234 Rohan	M	
104 CN	2			

11 rows selected.

```
SQL> SELECT * FROM course
  2  UNION
  3  SELECT * FROM participant;
SELECT * FROM course
*
ERROR at line 1:
ORA-01789: query block has incorrect number of result columns
```

```
SQL> SELECT * FROM course
  2  minus
  3  SELECT * FROM participant;
SELECT * FROM course
*
ERROR at line 1:
ORA-01789: query block has incorrect number of result columns
```

//APPLY VARIOUS JOINS ON PARTICIPANT1 AND 2

```
SQL> SELECT *
  2  FROM PARTICIPANT_1 CROSS JOIN PARTICIPANT_2;
```

PID	PNAME	G	CID	PID	PNAME	G	CID
1001	Ayush	M	105	1001	Ayush	M	105
1001	Ayush	M	105	1111	VEDANT	M	105
1001	Ayush	M	105	3333	ADARSH	M	101
1001	Ayush	M	105	4444	VARUN	M	102
1001	Ayush	M	105	6666	Sanjana	F	101
1001	Ayush	M	105	7777	AKSHAT	M	
1001	Ayush	M	105	9999	Shilpa	F	102
1234	Rohan	M		1001	Ayush	M	105
1234	Rohan	M		1111	VEDANT	M	105
1234	Rohan	M		3333	ADARSH	M	101
1234	Rohan	M		4444	VARUN	M	102

PID	PNAME	G	CID	PID	PNAME	G	CID
1234	Rohan	M		6666	Sanjana	F	101
1234	Rohan	M		7777	AKSHAT	M	
1234	Rohan	M		9999	Shilpa	F	102
6666	Sanjana	F	101	1001	Ayush	M	105
6666	Sanjana	F	101	1111	VEDANT	M	105
6666	Sanjana	F	101	3333	ADARSH	M	101
6666	Sanjana	F	101	4444	VARUN	M	102
6666	Sanjana	F	101	6666	Sanjana	F	101
6666	Sanjana	F	101	7777	AKSHAT	M	
6666	Sanjana	F	101	9999	Shilpa	F	102
8888	Pranav	M	103	1001	Ayush	M	105

```
      PID PNAME                G       CID       PID PNAME                G       CID
---------- ------------------------- - ---------- ---------- ------------------------- - ----------
      8888 Pranav                M       103      1111 VEDANT               M       105
      8888 Pranav                M       103      3333 ADARSH               M       101
      8888 Pranav                M       103      4444 VARUN                M       102
      8888 Pranav                M       103      6666 Sanjana              F       101
      8888 Pranav                M       103      7777 AKSHAT               M
      8888 Pranav                M       103      9999 Shilpa               F       102

28 rows selected.

SQL> SELECT *
  2  FROM PARTICIPANT_1 P1 JOIN PARTICIPANT_2 P2
  3  ON P1.PID = P2.PID;

      PID PNAME                G       CID       PID PNAME                G       CID
---------- ------------------------- - ---------- ---------- ------------------------- - ----------
      1001 Ayush                 M       105      1001 Ayush                M       105
      6666 Sanjana               F       101      6666 Sanjana              F       101

SQL> SELECT *
  2  FROM PARTICIPANT_1 NATURAL JOIN PARTICIPANT_2;

      PID PNAME                G       CID
---------- ------------------------- - ----------
      1001 Ayush                 M       105
      6666 Sanjana               F       101

SQL> SELECT *
  2  FROM PARTICIPANT_1 P1 LEFT OUTER JOIN PARTICIPANT_2 P2
```

```
  3  ON P1.PID = P2.PID;

       PID PNAME                G       CID       PID PNAME                G       CID
---------- ------------------------ - ---------- ---------- ------------------------ - ----------
      1001 Ayush                    M       105       1001 Ayush                    M       105
      6666 Sanjana                  F       101       6666 Sanjana                  F       101
      8888 Pranav                   M       103
      1234 Rohan                    M

SQL> SELECT *
  2  FROM PARTICIPANT_1 P1 RIGHT OUTER JOIN PARTICIPANT_2 P2
  3  ON P1.PID = P2.PID;

       PID PNAME                G       CID       PID PNAME                G       CID
---------- ------------------------ - ---------- ---------- ------------------------ - ----------
      1001 Ayush                    M       105       1001 Ayush                    M       105
      6666 Sanjana                  F       101       6666 Sanjana                  F       101
                                                      1111 VEDANT                   M       105
                                                      7777 AKSHAT                   M
                                                      4444 VARUN                    M       102
                                                      9999 Shilpa                   F       102
                                                      3333 ADARSH                   M       101

7 rows selected.

SQL> SELECT *
  2  FROM PARTICIPANT_1 P1 FULL OUTER JOIN PARTICIPANT_2 P2
  3  ON P1.PID = P2.PID;

       PID PNAME                G       CID       PID PNAME                G       CID
---------- ------------------------ - ---------- ---------- ------------------------ - ----------
```

```
      1001 Ayush                M       105       1001 Ayush                M       105
                                        1111 VEDANT               M       105
                                        3333 ADARSH               M       101
                                        4444 VARUN                M       102
      6666 Sanjana              F       101       6666 Sanjana              F       101
                                        7777 AKSHAT               M
                                        9999 Shilpa               F       102
      8888 Pranav               M       103
      1234 Rohan                M

9 rows selected.

SQL> SELECT * FROM PARTICIPANT_1
  2  UNION
  3  SELECT * FROM PARTICIPANT_2;

       PID PNAME                G       CID
---------- ------------------------ - ----------
      1001 Ayush                M       105
      1111 VEDANT               M       105
      1234 Rohan                M
      3333 ADARSH               M       101
      4444 VARUN                M       102
      6666 Sanjana              F       101
      7777 AKSHAT               M
      8888 Pranav               M       103
      9999 Shilpa               F       102

9 rows selected.

SQL> SELECT * FROM PARTICIPANT_1
```

```
  2  MINUS
  3  SELECT * FROM PARTICIPANT_2;

       PID PNAME                G       CID
---------- ------------------------ - ----------
      1234 Rohan                M
      8888 Pranav               M       103

SQL> SELECT * FROM PARTICIPANT_1
  2  INTERSECT
  3  SELECT * FROM PARTICIPANT_2;

       PID PNAME                G       CID
---------- ------------------------ - ----------
      1001 Ayush                M       105
      6666 Sanjana              F       101

SQL> SELECT * FROM PARTICIPANT_1
  2  MINUS (
  3  SELECT * FROM PARTICIPANT_1
  4  MINUS
  5  SELECT * FROM PARTICIPANT_2
  6  );

       PID PNAME                G       CID
---------- ------------------------ - ----------
      1001 Ayush                M       105
      6666 Sanjana              F       101

SQL> SELECT *
  2  FROM PARTICIPANT_1 P1, PARTICIPANT_2 P2
```

```
  3  WHERE P1.PID (+) = P2.PID
  4  UNION
  5  SELECT *
  6  FROM PARTICIPANT_1 P1, PARTICIPANT_2 P2
  7  WHERE P1.PID = P2.PID (+);

     PID PNAME                G       CID       PID PNAME                G       CID
---------- ------------------------ - ---------- ---------- ------------------------ - ----------
    1001 Ayush                M       105      1001 Ayush                M       105
    1234 Rohan                M
    6666 Sanjana              F       101      6666 Sanjana              F       101
    8888 Pranav               M       103
                                      1111 VEDANT               M       105
                                      3333 ADARSH               M       101
                                      4444 VARUN                M       102
                                      7777 AKSHAT               M
                                      9999 Shilpa               F       102

9 rows selected.

SQL> commit;

Commit complete.

SQL> SELECT *
  2  FROM PARTICIPANT_1 NATURAL JOIN PARTICIPANT_2;

     PID PNAME                G       CID
---------- ------------------------ - ----------
    1001 Ayush                M       105
    6666 Sanjana              F       101
```

```
SQL> SELECT *
  2  FROM PARTICIPANT_1 JOIN PARTICIPANT_2
  3  ON PARTICIPANT_1.PID=PARTICIPANT_2.PID;

       PID PNAME                G       CID       PID PNAME                G       CID
---------- ------------------------ - ---------- ---------- ------------------------ - ----------
      1001 Ayush                    M       105       1001 Ayush                    M       105
      6666 Sanjana                  F       101       6666 Sanjana                  F       101

SQL> --SOLVE Questions of Class

SQL> SELECT * FROM COURSE;

       CID CNAME                          CREDIT
---------- ------------------------------ ----------
       101 DBMS                                4
       102 OOPS                                3
       103 OS                                  5
       104 CN                                  2
       105 CG                                  1

SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                G       CID
---------- ------------------------ - ----------
      6666 Sanjana                  F       101
      9999 Shilpa                   F       102
      8888 Pranav                   M       103
      1001 Ayush                    M       105
```

```
      7777 AKSHAT                M

      1111 VEDANT                M       105

      2222 KAPIL                 M       103

      4444 VARUN                 M       102

      3333 ADARSH                M       101

      1234 Rohan                 M

10 rows selected.

SQL> SELECT CID,CNAME FROM COURSE;

      CID CNAME

---------- ------------------------------

      105 CG

      104 CN

      101 DBMS

      102 OOPS

      103 OS

SQL> SELECT CID,COUNT(*) AS PARTICIPANT_ENROLLED
  2  FROM PARTICIPANT
  3  GROUP BY CID;

      CID PARTICIPANT_ENROLLED

---------- --------------------

                    2

      102               2

      101               2

      105               2

      103               2
```

```
SQL> SELECT CID
  2  FROM PARTICIPANT
  3  WHERE CID IS NULL;

      CID
----------
```

```
SQL> SELECT MIN(CREDIT),MAX(CREDIT),AVG(CREDIT)
  2  FROM COURSE;

MIN(CREDIT) MAX(CREDIT) AVG(CREDIT)
----------- ----------- -----------
          1           5           3
```

```
SQL> SELECT COUNT(C.CID)
  2  FROM COURSE C
  3  JOIN PARTICIPANT P ON C.CID=P.CID
  4  WHERE C.CNAME='DBMS';

COUNT(C.CID)
------------
           2
```

```
SQL> SELECT CID,COUNT(*)
  2  FROM PARTICIPANT
  3  GROUP BY CID
  4  HAVING COUNT(*)>=3;
```

no rows selected

```
SQL> SELECT CID,COUNT(*)
  2  FROM PARTICIPANT
  3  GROUP BY CID
  4  HAVING COUNT(*)>=2;

      CID   COUNT(*)
---------- ----------
                2
      102         2
      101         2
      105         2
      103         2

SQL> SELECT CID,CNAME,PID,PNAME
  2  FROM COURSE NATURAL JOIN PARTICIPANT;

      CID CNAME                          PID PNAME
---------- ------------------------------ ---------- -------------------------
      101 DBMS                         6666 Sanjana
      102 OOPS                         9999 Shilpa
      103 OS                           8888 Pranav
      105 CG                           1001 Ayush
      105 CG                           1111 VEDANT
      103 OS                           2222 KAPIL
      102 OOPS                         4444 VARUN
      101 DBMS                         3333 ADARSH

8 rows selected.
```

```
SQL>  SELECT CID,CNAME,COUNT(*)
  2   FROM COURSE C,PARTICIPANT P
  3   WHERE C.CID=P.CID AND CNAME='DBMS'
  4   GROUP BY C.CID,CNAME;
 SELECT CID,CNAME,COUNT(*)
        *
ERROR at line 1:
ORA-00918: column ambiguously defined


SQL>  SELECT C.CID,CNAME,COUNT(*)
  2   FROM COURSE C,PARTICIPANT P
  3   WHERE C.CID=P.CID AND CNAME='DBMS'
  4   GROUP BY C.CID,CNAME;

     CID CNAME                     COUNT(*)
---------- ------------------------------ ----------
     101 DBMS                            2

SQL> SELECT CNAME
  2  FROM COURSE
  3  WHERE CREDIT=(SELECT MIN(CREDIT) FROM COURSE);

CNAME
------------------------------
CG

SQL> SELECT CNAME
  2  FROM COURSE
  3  WHERE CREDIT=(SELECT MAX(CREDIT) FROM COURSE);
```

```
CNAME
------------------------------
OS


SQL> SELECT * FROM PARTICIPANT
  2  WHERE CID IS NULL;

       PID PNAME                 G       CID
---------- ------------------------ - ----------
      7777 AKSHAT                 M
      1234 Rohan                  M

SQL> COMMIT;

Commit complete.

SQL> SPOOL OFF
```

CONCLUSION: In this practical, we successfully implemented various joins And set operations.