DBMS Practical-2

Name: Gaurav Kedia RollNo: 39 Branch: AIML Batch: E2

Questions:

1) All joins on course and participant schema.
2) All joins on participant-1 and participant-2 schema
3) all set operation on participant-1 and participant-2 schema
4) Foreign key deletion rule testing (NO ACTION, ON delete set null, and ON delete cascade) with output.

```
SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                     G         CID
---------- ------------------------- - ----------
      1001 Albert DCosta             M         101
      1002 Foster Silva              M         102
      1003 Maria Anderson            F         102
      1004 Pamela Smith              F         101
      1005 Indiana Jones             M
      1006 Gaurav Kedia             M         102
      1007 CHAITREYA BHELKAR         M         102

7 rows selected.

SQL> SELECT * FROM COURSE;

       CID CNAME                           CREDIT
---------- ------------------------------ ----------
       101 Database Management Systems             5
       102 Object-Oriented Systems                 4
       103 MATHEMATICS                             5
       104 MICROCONTROLLER                         4
       105 MACHINE LEARNING                        3
       106 DSA                                     4

6 rows selected.


SQL> SELECT * FROM COURSE,PARTICIPANT
  2  WHERE COURSE.CID=PARTICIPANT.CID;

       CID CNAME                           CREDIT        PID
---------- ------------------------------ ---------- ----------
PNAME                     G         CID
------------------------- - ----------
       101 Database Management Systems             5       1001
Albert DCosta             M         101

       101 Database Management Systems             5       1004
Pamela Smith              F         101

       102 Object-Oriented Systems                 4       1006
Gaurav Kedia              M         102


       CID CNAME                           CREDIT        PID
```

```
---------- ------------------------------ ---------- ----------
PNAME                     G        CID
------------------------- - ----------
       102 Object-Oriented Systems                4       1007
Parag Dewangan            M        102

       102 Object-Oriented Systems                4       1002
Foster Silva              M        102

       102 Object-Oriented Systems                4       1003
Maria Anderson            F        102


6 rows selected.

SQL> SET LINESIZE 250;
SQL> SELECT * FROM COURSE,PARTICIPANT
  2  WHERE COURSE.CID=PARTICIPANT.CID;

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       101 Database Management Systems             5       1001 Albert
DCosta             M        101
       101 Database Management Systems             5       1004 Pamela
Smith              F        101
       102 Object-Oriented Systems                 4       1006 Gaurav
Kedia            M        102
       102 Object-Oriented Systems                 4       1007 CHAITREYA
BHELKAR         M        102
       102 Object-Oriented Systems                 4       1002 Foster
Silva              M        102
       102 Object-Oriented Systems                 4       1003 Maria
Anderson            F        102
6 rows selected.

SQL> SELECT * FROM COURSE CROSS JOIN PARTICIPANT;

       CID CNAME                                CREDIT        PID PNAME
G
CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       101 Database Management Systems             5       1001 Albert
DCosta             M        101
       101 Database Management Systems             5       1002 Foster
Silva              M        102
       101 Database Management Systems             5       1003 Maria
Anderson            F        102
       101 Database Management Systems             5       1004 Pamela
Smith              F        101
       101 Database Management Systems             5       1005 Indiana
Jones             M
       101 Database Management Systems             5       1006 Gaurav
Kedia            M        102
       101 Database Management Systems             5       1007 CHAITREYA
BHELKAR         M        102
```

```
       102 Object-Oriented Systems                 4       1001 Albert
DCosta             M        101
       102 Object-Oriented Systems                 4       1002 Foster
Silva              M        102
       102 Object-Oriented Systems                 4       1003 Maria
Anderson            F        102
       102 Object-Oriented Systems                 4       1004 Pamela
Smith              F        101

       CID CNAME                              CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       102 Object-Oriented Systems                 4       1005 Indiana
Jones             M
       102 Object-Oriented Systems                 4
                                                           1006 Gaurav
Kedia             M        102
       102 Object-Oriented Systems                 4       1007 CHAITREYA
BHELKAR         M        102
       103 MATHEMATICS                             5       1001 Albert
DCosta             M        101
       103 MATHEMATICS                             5       1002 Foster
Silva              M        102
       103 MATHEMATICS                             5       1003 Maria
Anderson            F        102
       103 MATHEMATICS                             5       1004 Pamela
Smith              F        101
       103 MATHEMATICS                             5       1005 Indiana
Jones             M
       103 MATHEMATICS                             5
                                                           1006 Gaurav
Kedia             M        102
       103 MATHEMATICS                             5       1007 CHAITREYA
BHELKAR         M        102
       104 MICROCONTROLLER                         4       1001 Albert
DCosta             M        101

       CID CNAME                              CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       104 MICROCONTROLLER                         4       1002 Foster
Silva              M        102
       104 MICROCONTROLLER                         4       1003 Maria
Anderson            F        102
       104 MICROCONTROLLER                         4       1004 Pamela
Smith              F        101
       104 MICROCONTROLLER                         4       1005 Indiana
Jones             M
       104 MICROCONTROLLER                         4
                                                           1006 Gaurav
Kedia             M        102
       104 MICROCONTROLLER                         4       1007 CHAITREYA
BHELKAR         M        102
       105 MACHINE LEARNING                        3       1001 Albert
DCosta             M        101
       105 MACHINE LEARNING                        3       1002 Foster
Silva              M        102
       105 MACHINE LEARNING                        3       1003 Maria
Anderson            F        102
```

```
       105 MACHINE LEARNING                        3       1004 Pamela
Smith              F        101
       105 MACHINE LEARNING                        3       1005 Indiana
Jones             M

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       105 MACHINE LEARNING                        3       1006 Gaurav
Kedia            M        102
       105 MACHINE LEARNING                        3       1007 CHAITREYA
BHELKAR         M        102
       106 DSA                                     4       1001 Albert
DCosta             M        101
       106 DSA                                     4       1002 Foster
Silva              M        102
       106 DSA                                     4       1003 Maria
Anderson            F        102
       106 DSA                                     4       1004 Pamela
Smith              F        101
       106 DSA                                     4       1005 Indiana
Jones             M
       106 DSA                                     4
       1006 Gaurav
Kedia            M        102
       106 DSA                                     4       1007 CHAITREYA
BHELKAR         M        102

42 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.'
--------------------------------------------------------------------------
--------------------------------------------------
Albert DCosta takes course in Database Management Systems of 5
credits.
Pamela Smith takes course in Database Management Systems of 5
credits.
Gaurav Kedia takes course in Object-Oriented Systems of 4
credits.
Parag Dewangan takes course in Object-Oriented Systems of 4
credits.
Foster Silva takes course in Object-Oriented Systems of 4
credits.
Maria Anderson takes course in Object-Oriented Systems of 4 credits.

6 rows selected.


SQL> SELECT PNAME || ' HAS OPTED FOR COURSE ' || CNAME || ' OF ' ||
CREDIT || ' CREDITS.'
  2  FROM COURSE C JOIN PARTICIPANT P
  3  ON C.CID = P.CID;
```

```
PNAME||'HASOPTEDFORCOURSE'||CNAME||'OF'||CREDIT||'CREDITS.'
--------------------------------------------------------------------------------
------------------------------------------------------------
Albert DCosta HAS OPTED FOR COURSE Database Management Systems OF 5
CREDITS.
Pamela Smith HAS OPTED FOR COURSE Database Management Systems OF 5
CREDITS.
Gaurav Kedia HAS OPTED FOR COURSE Object-Oriented Systems OF 4
CREDITS.
Parag Dewangan HAS OPTED FOR COURSE Object-Oriented Systems OF 4
CREDITS.
Foster Silva HAS OPTED FOR COURSE Object-Oriented Systems OF 4
CREDITS.
Maria Anderson HAS OPTED FOR COURSE Object-Oriented Systems OF 4
CREDITS.

6 rows selected.

SQL> INSERT INTO PARTICIPANT VALUES (&PID,&PNAME,&G,&CID);
Enter value for pid: 109
Enter value for pname: 'RAMESH'
Enter value for g: NULL
Enter value for cid: 109
old   1: INSERT INTO PARTICIPANT VALUES (&PID,&PNAME,&G,&CID)
new   1: INSERT INTO PARTICIPANT VALUES (109,'RAMESH',NULL,109)
INSERT INTO PARTICIPANT VALUES (109,'RAMESH',NULL,109)
                                            *
ERROR at line 1:
ORA-01400: cannot insert NULL into ("E39Gaurav"."PARTICIPANT"."GENDER")


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(CREDI
T,'CREDITS.'))))))
--------------------------------------------------------------------------------
--------------------------------------------------
-
Albert DCosta takes course in Database Management Systems of 5
credits.
Pamela Smith takes course in Database Management Systems of 5
credits.
Gaurav Kedia takes course in Object-Oriented Systems of 4
credits.
Parag Dewangan takes course in Object-Oriented Systems of 4
credits.
Foster Silva takes course in Object-Oriented Systems of 4
credits.
Maria Anderson takes course in Object-Oriented Systems of 4 credits.

6 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
--------------------------------------------------------------------------
--------------------------------------------------
Albert DCosta takes course in Database Management Systems of 5 credits.
Pamela Smith takes course in Database Management Systems of 5 credits.
Gaurav Kedia takes course in Object-Oriented Systems of 4 credits.
Parag Dewangan takes course in Object-Oriented Systems of 4 credits.
Foster Silva takes course in Object-Oriented Systems of 4 credits.
Maria Anderson takes course in Object-Oriented Systems of 4 credits.

6 rows selected.

SQL> DESC COURSE;
 Name
Null?    Type
 ----------------------------------------------------------------------------
---------------------------------------------------------------------------- -
------- ------------------------------------------------------------------
--------------------------------
 CID
NOT NULL NUMBER(3)
 CNAME
NOT NULL VARCHAR2(30)
 CREDIT
NUMBER(1)

SQL> DESC PARTICIPANT;
 Name
Null?    Type
 ----------------------------------------------------------------------------
---------------------------------------------------------------------------- -
------- ------------------------------------------------------------------
--------------------------------
 PID
NOT NULL NUMBER(4)
 PNAME
NOT NULL VARCHAR2(25)
 GENDER
NOT NULL CHAR(1)
 CID
NUMBER(3)

SQL> DESC USER_CONSTRAINTS;
 Name
Null?    Type
 ----------------------------------------------------------------------------
---------------------------------------------------------------------------- -
------- ------------------------------------------------------------------
--------------------------------
 OWNER
VARCHAR2(30)

CONSTRAINT_NAME
NOT NULL VARCHAR2(30)
```

```
 CONSTRAINT_TYPE
VARCHAR2(1)
 TABLE_NAME
NOT NULL VARCHAR2(30)

SEARCH_CONDITION
LONG
 R_OWNER
VARCHAR2(30)
 R_CONSTRAINT_NAME
VARCHAR2(30)

DELETE_RULE
VARCHAR2(9)
 STATUS
VARCHAR2(8)
 DEFERRABLE
VARCHAR2(14)

DEFERRED
VARCHAR2(9)
 VALIDATED
VARCHAR2(13)
 GENERATED
VARCHAR2(14)
 BAD
VARCHAR2(3)
 RELY
VARCHAR2(4)
 LAST_CHANGE
DATE
 INDEX_OWNER
VARCHAR2(30)
 INDEX_NAME
VARCHAR2(30)

INVALID
VARCHAR2(7)
 VIEW_RELATED
VARCHAR2(14)
```

```
SQL> SELECT CONSTRAINT_NAME,CONSTRAINT_TYPE,DELETE_RULE,TABLE_NAME FROM
USER_CONSTRAINTS;

CONSTRAINT_NAME                C DELETE_RU
TABLE_NAME
------------------------------ - --------- ------------------------------
-
SYS_C0011237                    C           COURSE
SYS_C0011239                   C           COURSE
COURSE_CK_CID                   C           COURSE
COURSE_CK_CREDIT                C           COURSE
SYS_C0011243                    C           PARTICIPANT
SYS_C0011244                    C           PARTICIPANT
SYS_C0011245                    C           PARTICIPANT
```

```
PARTICIPANT_CK_PID             C           PARTICIPANT
PARTICIPANT_CK_GENDER          C           PARTICIPANT
SYS_C0011250                   C           COLLEGE
SYS_C0011251                   C           COLLEGE

CONSTRAINT_NAME                C DELETE_RU TABLE_NAME
------------------------------ - --------- ------------------------------
PARTICIPANT_FK_COURSE_CID      R NO ACTION PARTICIPANT
COURSE_PK_CID                  P           COURSE
COURSE_UQ_CNAME                U           COURSE
PARTICIPANT_PK_PID             P           PARTICIPANT
COLLEGE_PK_CNAME               P           COLLEGE

16 rows selected.


SQL> SELECT CONSTRAINT_NAME,CONSTRAINT_TYPE,DELETE_RULE,TABLE_NAME FROM
USER_CONSTRAINTS
  2  WHERE TABLE_NAME='PARTICIPANT';

CONSTRAINT_NAME                C DELETE_RU
TABLE_NAME
------------------------------ - --------- ------------------------------
-
SYS_C0011243                   C
PARTICIPANT
SYS_C0011244                   C           PARTICIPANT
SYS_C0011245                   C           PARTICIPANT
PARTICIPANT_CK_PID             C           PARTICIPANT
PARTICIPANT_CK_GENDER          C           PARTICIPANT
PARTICIPANT_PK_PID             P           PARTICIPANT
PARTICIPANT_FK_COURSE_CID      R NO ACTION PARTICIPANT

7 rows selected.

SQL> DELETE FROM COURSE
  2  WHERE CID=101;
DELETE FROM COURSE
*
ERROR at line 1:
ORA-02292: integrity constraint (E39Gaurav.PARTICIPANT_FK_COURSE_CID)
violated - child record found


SQL> ALTER TABLE PARTICIPANT DROP CONSTRAINT PARTICIPANT_FK_COURSE_CID;

Table altered.

SQL> SELECT CONSTRAINT_NAME,CONSTRAINT_TYPE,DELETE_RULE,TABLE_NAME FROM
USER_CONSTRAINTS
  2  WHERE TABLE_NAME='PARTICIPANT';

CONSTRAINT_NAME                C DELETE_RU
TABLE_NAME
------------------------------ - --------- ------------------------------
-
SYS_C0011243                   C
PARTICIPANT
```

```
SYS_C0011244                   C
PARTICIPANT
SYS_C0011245                   C
PARTICIPANT
PARTICIPANT_CK_PID             C           PARTICIPANT
PARTICIPANT_CK_GENDER          C           PARTICIPANT
PARTICIPANT_PK_PID             P           PARTICIPANT

6 rows selected.

SQL> ALTER TABLE PARTICIPANT ADD CONSTRAINT PARTICIPANT_FK_COURSE_CID
FOREIGN KEY
  2  (CID) REFERENCES COURSE(CID) ON DELETE CASCADE;

Table altered.


SQL> SELECT CONSTRAINT_NAME,CONSTRAINT_TYPE,DELETE_RULE,TABLE_NAME FROM
USER_CONSTRAINTS
  2  WHERE TABLE_NAME='PARTICIPANT';

CONSTRAINT_NAME                C DELETE_RU TABLE_NAME
------------------------------ - --------- ------------------------------
SYS_C0011243                   C           PARTICIPANT
SYS_C0011244                   C           PARTICIPANT
SYS_C0011245                   C           PARTICIPANT
PARTICIPANT_CK_PID             C           PARTICIPANT
PARTICIPANT_CK_GENDER          C           PARTICIPANT
PARTICIPANT_PK_PID             P           PARTICIPANT
PARTICIPANT_FK_COURSE_CID      R CASCADE   PARTICIPANT

7 rows selected.

SQL> DELETE FROM COURSE
  2  WHERE CID=101;

1 row deleted.

SQL> SELECT * FROM COURSE;

       CID CNAME                            CREDIT
---------- ------------------------------ ----------
       102 Object-Oriented Systems                 4
       103 MATHEMATICS                             5
       104 MICROCONTROLLER                         4
       105 MACHINE LEARNING                        3
       106 DSA                                     4


SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                      G        CID
---------- ------------------------- - ----------
      1002 Foster Silva              M        102
      1003 Maria Anderson            F        102
      1005 Indiana Jones             M
      1006 Gaurav Kedia             M        102
      1007 Parag Dewangan            M        102
```

```
SQL> ROLLBACK;

Rollback complete.


SQL> SELECT * FROM COURSE;

       CID CNAME                            CREDIT
---------- ------------------------------ ----------
       101 Database Management Systems             5
       102 Object-Oriented Systems                 4
       103 MATHEMATICS                             5
       104 MICROCONTROLLER                         4
       105 MACHINE LEARNING                        3
       106 DSA                                     4

6 rows selected.

SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                     G         CID
---------- ------------------------- - ----------
      1001 Albert DCosta             M         101
      1002 Foster Silva              M         102
      1003 Maria Anderson            F         102
      1004 Pamela Smith              F         101
      1005 Indiana Jones             M
      1006 Gaurav Kedia             M         102
      1007 Parag Dewangan            M         102

7 rows selected.

SQL> ALTER TABLE PARTICIPANT DROP CONSTRAINT PARTICIPANT_FK_COURSE_CID;

Table altered.

SQL> ALTER TABLE PARTICIPANT ADD CONSTRAINT PARTICIPANT_FK_COURSE_CID
FOREIGN KEY
  2  (CID) REFERENCES COURSE(CID) ON DELETE SET NULL;

Table altered.

SQL> DELETE FROM COURSE
  2  WHERE CID=101;

1 row deleted.

SQL> SELECT * FROM COURSE;

       CID CNAME
CREDIT
---------- ------------------------------ ---------
-
       102 Object-Oriented Systems
4
```

```
       103 MATHEMATICS
5
       104 MICROCONTROLLER
4
       105 MACHINE LEARNING
3
       106 DSA
4


SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                     G
CID
---------- ------------------------- - ---------
-
      1001 Albert DCosta
M
      1002 Foster Silva              M        102
      1003 Maria Anderson            F        102
      1004 Pamela Smith              F
      1005 Indiana Jones             M
      1006 Gaurav Kedia             M        102
      1007 Parag Dewangan            M        102

7 rows selected.

SQL> ROLLBACK;

Rollback complete.


SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                     G
CID
---------- ------------------------- - ---------
-
      1001 Albert DCosta             M
101
      1002 Foster Silva              M
102
      1003 Maria Anderson            F
102
      1004 Pamela Smith              F        101
      1005 Indiana Jones             M
      1006 Gaurav Kedia             M        102
      1007 Parag Dewangan            M        102

7 rows selected.

SQL> SELECT * FROM COURSE;

       CID CNAME                           CREDIT
---------- ------------------------------ ----------
       101 Database Management Systems             5
       102 Object-Oriented Systems                 4
       103 MATHEMATICS                             5
```

```
       104 MICROCONTROLLER                          4
       105 MACHINE LEARNING                         3
       106 DSA                                      4

6 rows selected.

SQL> DESC DUAL;
 Name
Null?    Type
 ----------------------------------------------------------------------------
---------------------------------------------------------------------------- -
------- ------------------------------------------------------------------
------------------------------

DUMMY
VARCHAR2(1)

SQL> SELECT * FROM DUAL;

D
-
X


SQL> SELECT SYDATE FROM DUAL;
SELECT SYDATE FROM DUAL
       *
ERROR at line 1:
ORA-00904: "SYDATE": invalid identifier


SQL> SELECT SYSDATE FROM DUAL;

SYSDATE
---------
23-SEP-22

SQL> SELECT SYSDATE,SYSTIMESTAMP FROM DUAL;

SYSDATE   SYSTIMESTAMP
--------- ------------------------------------------------------------------
------------
23-SEP-22 23-SEP-22 11.24.40.588000 AM +05:30

SQL> SELECT ABS(-5),SIGN(-2),SQRT(9),CEIL(3.5289);
SELECT ABS(-5),SIGN(-2),SQRT(9),CEIL(3.5289)
                                           *
ERROR at line 1:
ORA-00923: FROM keyword not found where expected


SQL> SELECT ABS(-5),SIGN(-2),SQRT(9),CEIL(3.5289) FROM DUAL;

   ABS(-5)   SIGN(-2)    SQRT(9) CEIL(3.5289)
---------- ---------- ---------- ------------
         5         -1          3            4

SQL> SELECT * FROM PARTICIPANT;
```

```
       PID PNAME                     G        CID
---------- ------------------------- - ----------
      1001 Albert DCosta             M        101
      1002 Foster Silva              M        102
      1003 Maria Anderson            F        102
      1004 Pamela Smith              F        101
      1005 Indiana Jones             M
      1006 Gaurav Kedia              M        102
      1007 Parag Dewangan            M        102

7 rows selected.

SQL> SELECT * FROM COURSE;

       CID CNAME                            CREDIT
---------- ------------------------------ ----------
       101 Database Management Systems             5
       102 Object-Oriented Systems                 4
       103 MATHEMATICS                             5
       104 MICROCONTROLLER                         4
       105 MACHINE LEARNING                        3
       106 DSA                                     4

6 rows selected.

SQL> INSERT INTO PARTICIPANT VALUES(1008,'DAA','M',NULL);

1 row created.

SQL> INSERT INTO PARTICIPANT VALUES(1009,'COMPUTER
PROGRAMMING','M',NULL);

1 row created.

SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                     G        CID
---------- ------------------------- - ----------
      1001 Albert DCosta             M        101
      1002 Foster Silva              M        102
      1003 Maria Anderson            F        102
      1004 Pamela Smith              F        101
      1005 Indiana Jones             M
      1006 Gaurav Kedia              M        102
      1007 Parag Dewangan            M        102
      1008 DAA                       M
      1009 COMPUTER PROGRAMMING      M

9 rows selected.

SQL> INSERT INTO COURSE VALUES(&CID,&CNAME,&CREDIT)
  2  ;
Enter value for cid: 108
Enter value for cname: 'COMPUTER PROGRAMMING'
Enter value for credit: 2
old   1: INSERT INTO COURSE VALUES(&CID,&CNAME,&CREDIT)
new   1: INSERT INTO COURSE VALUES(108,'COMPUTER PROGRAMMING',2)
```

```
1 row created.

SQL> DELETE FROM PARTICIPANT WHERE PID=1009;

1 row deleted.

SQL> SELECT COUNT(CID),CID FROM PARTICIPANT GROUP BY CID;

COUNT(CID)        CID
---------- ----------
         0
         4        102
         2        101

SQL> INSERT INTO PARTICIPANT VALUES(1009,'VIRAT KOHLI','M',NULL);

1 row created.


SQL> SELECT COUNT(*),CID FROM PARTICIPANT GROUP BY CID;

  COUNT(*)
CID
---------- ---------
-

3
         4
102
         2
101

SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                     G
CID
---------- ------------------------- - ----------
      1001 Albert DCosta             M        101
      1002 Foster Silva              M        102
      1003 Maria Anderson            F        102
      1004 Pamela Smith              F        101
      1005 Indiana Jones             M
      1006 Gaurav Kedia              M        102
      1007 Parag Dewangan            M        102
      1008 DAA                       M
      1009 VIRAT KOHLI               M

9 rows selected.

SQL> DELETE FROM PARTICIPANT WHERE PID=1008;

1 row deleted.


SQL> SELECT COUNT(CID) AS NO_OF_PARTICIPANT_IN_COURSE,CID FROM
PARTICIPANT GROUP BY CID;
```

```
NO_OF_PARTICIPANT_IN_COURSE
CID
--------------------------- ---------
-

0
                          4
102
                          2
101



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

  COUNT(*)        CID
---------- ----------
         2
         4        102
         2        101

SQL> SELECT * FROM COURSE CROSS JOIN PARTICIPANT;

       CID CNAME                                CREDIT        PID PNAME
G
CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       101 Database Management Systems             5       1001 Albert
DCosta             M        101
       101 Database Management Systems             5       1002 Foster
Silva              M        102
       101 Database Management Systems             5       1003 Maria
Anderson            F        102
       101 Database Management Systems             5       1004 Pamela
Smith              F        101
       101 Database Management Systems             5       1005 Indiana
Jones             M
       101 Database Management Systems             5
                                                           1006 Gaurav
Kedia            M        102
       101 Database Management Systems             5       1007 CHAITREYA
BHELKAR         M        102
       101 Database Management Systems             5       1009 VIRAT
KOHLI               M
       102 Object-Oriented Systems                 4       1001 Albert
DCosta             M        101
       102 Object-Oriented Systems                 4       1002 Foster
Silva              M        102
       102 Object-Oriented Systems                 4       1003 Maria
Anderson            F        102

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
```

```
       102 Object-Oriented Systems                 4       1004 Pamela
Smith              F        101
       102 Object-Oriented Systems                 4       1005 Indiana
Jones              M
       102 Object-Oriented Systems                 4
                                                           1006 Gaurav
Kedia              M        102
       102 Object-Oriented Systems                 4       1007 CHAITREYA
BHELKAR         M        102
       102 Object-Oriented Systems                 4       1009 VIRAT
KOHLI               M
       103 MATHEMATICS                             5       1001 Albert
DCosta             M        101
       103 MATHEMATICS                             5       1002 Foster
Silva              M        102
       103 MATHEMATICS                             5       1003 Maria
Anderson            F        102
       103 MATHEMATICS                             5       1004 Pamela
Smith              F        101
       103 MATHEMATICS                             5       1005 Indiana
Jones              M
       103 MATHEMATICS                             5
                                                           1006 Gaurav
Kedia              M        102

       CID CNAME                           CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       103 MATHEMATICS                             5       1007 CHAITREYA
BHELKAR         M        102
       103 MATHEMATICS                             5       1009 VIRAT
KOHLI               M
       104 MICROCONTROLLER                         4       1001 Albert
DCosta             M        101
       104 MICROCONTROLLER                         4       1002 Foster
Silva              M        102
       104 MICROCONTROLLER                         4       1003 Maria
Anderson            F        102
       104 MICROCONTROLLER                         4       1004 Pamela
Smith              F        101
       104 MICROCONTROLLER                         4       1005 Indiana
Jones              M
       104 MICROCONTROLLER                         4
                                                           1006 Gaurav
Kedia              M        102
       104 MICROCONTROLLER                         4       1007 CHAITREYA
BHELKAR         M        102
       104 MICROCONTROLLER                         4       1009 VIRAT
KOHLI               M
       105 MACHINE LEARNING                        3       1001 Albert
DCosta             M        101

       CID CNAME                           CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       105 MACHINE LEARNING                        3       1002 Foster
Silva              M        102
       105 MACHINE LEARNING                        3       1003 Maria
Anderson            F        102
```

```
       105 MACHINE LEARNING                        3       1004 Pamela
Smith              F        101
       105 MACHINE LEARNING                        3       1005 Indiana
Jones            M
       105 MACHINE LEARNING                        3
                                                           1006 Gaurav
Kedia            M        102
       105 MACHINE LEARNING                        3       1007 CHAITREYA
BHELKAR         M        102
       105 MACHINE LEARNING                        3       1009 VIRAT
KOHLI               M
       106 DSA                                     4       1001 Albert
DCosta             M        101
       106 DSA                                     4       1002 Foster
Silva              M        102
       106 DSA                                     4       1003 Maria
Anderson            F        102
       106 DSA                                     4       1004 Pamela
Smith              F        101

       CID CNAME                          CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       106 DSA                                     4       1005 Indiana
Jones             M
       106 DSA                                     4
                                                           1006 Gaurav
Kedia            M        102
       106 DSA                                     4       1007 CHAITREYA
BHELKAR         M        102
       106 DSA                                     4       1009 VIRAT
KOHLI               M
       108 COMPUTER PROGRAMMING                    2       1001 Albert
DCosta             M        101
       108 COMPUTER PROGRAMMING                    2       1002 Foster
Silva              M        102
       108 COMPUTER PROGRAMMING                    2       1003 Maria
Anderson            F        102
       108 COMPUTER PROGRAMMING                    2       1004 Pamela
Smith              F        101
       108 COMPUTER PROGRAMMING                    2       1005 Indiana
Jones             M
       108 COMPUTER PROGRAMMING                    2
                                                           1006 Gaurav
Kedia            M        102
       108 COMPUTER PROGRAMMING                    2       1007 CHAITREYA
BHELKAR         M        102

       CID CNAME                          CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       108 COMPUTER PROGRAMMING                    2       1009 VIRAT
KOHLI               M

56 rows selected.

SQL> SELECT * FROM COURSE,PARTICIPANT;
```

```
       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
--------------- - ----------
       101 Database Management Systems             5       1001 Albert
DCosta             M        101
       101 Database Management Systems             5       1002 Foster
Silva              M        102
       101 Database Management Systems             5       1003 Maria
Anderson            F        102
       101 Database Management Systems             5       1004 Pamela
Smith              F        101
       101 Database Management Systems             5       1005 Indiana
Jones             M
       101 Database Management Systems             5
                                                          1006 Gaurav
Kedia             M        102
       101 Database Management Systems             5       1007 CHAITREYA
BHELKAR         M        102
       101 Database Management Systems             5       1009 VIRAT
KOHLI              M
       102 Object-Oriented Systems                 4       1001 Albert
DCosta             M        101
       102 Object-Oriented Systems                 4       1002 Foster
Silva              M        102
       102 Object-Oriented Systems                 4       1003 Maria
Anderson            F        102

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
--------------- - ----------
       102 Object-Oriented Systems                 4       1004 Pamela
Smith              F        101
       102 Object-Oriented Systems                 4       1005 Indiana
Jones             M
       102 Object-Oriented Systems                 4
                                                          1006 Gaurav
Kedia             M        102
       102 Object-Oriented Systems                 4       1007 CHAITREYA
BHELKAR         M        102
       102 Object-Oriented Systems                 4       1009 VIRAT
KOHLI              M
       103 MATHEMATICS                             5       1001 Albert
DCosta             M        101
       103 MATHEMATICS                             5       1002 Foster
Silva              M        102
       103 MATHEMATICS                             5       1003 Maria
Anderson            F        102
       103 MATHEMATICS                             5       1004 Pamela
Smith              F        101
       103 MATHEMATICS                             5       1005 Indiana
Jones             M
       103 MATHEMATICS                             5
                                                          1006 Gaurav
Kedia             M        102

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
--------------- - ----------
```

```
       103 MATHEMATICS                                5       1007 CHAITREYA
BHELKAR         M        102
       103 MATHEMATICS                                5       1009 VIRAT
KOHLI               M
       104 MICROCONTROLLER                            4       1001 Albert
DCosta              M        101
       104 MICROCONTROLLER                            4       1002 Foster
Silva               M        102
       104 MICROCONTROLLER                            4       1003 Maria
Anderson             F        102
       104 MICROCONTROLLER                            4       1004 Pamela
Smith               F        101
       104 MICROCONTROLLER                            4       1005 Indiana
Jones              M
       104 MICROCONTROLLER                            4       1006 Gaurav
Kedia             M        102
       104 MICROCONTROLLER                            4       1007 CHAITREYA
BHELKAR         M        102
       104 MICROCONTROLLER                            4       1009 VIRAT
KOHLI               M
       105 MACHINE LEARNING                           3       1001 Albert
DCosta              M        101

       CID CNAME                              CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       105 MACHINE LEARNING                           3       1002 Foster
Silva               M        102
       105 MACHINE LEARNING                           3       1003 Maria
Anderson             F        102
       105 MACHINE LEARNING                           3       1004 Pamela
Smith               F        101
       105 MACHINE LEARNING                           3       1005 Indiana
Jones              M
       105 MACHINE LEARNING                           3       1006 Gaurav
Kedia             M        102
       105 MACHINE LEARNING                           3       1007 CHAITREYA
BHELKAR         M        102
       105 MACHINE LEARNING                           3       1009 VIRAT
KOHLI               M
       106 DSA                                        4       1001 Albert
DCosta              M        101
       106 DSA                                        4       1002 Foster
Silva               M        102
       106 DSA                                        4       1003 Maria
Anderson             F        102
       106 DSA                                        4       1004 Pamela
Smith               F        101

       CID CNAME                              CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       106 DSA                                        4       1005 Indiana
Jones              M
       106 DSA                                        4       1006 Gaurav
Kedia             M        102
```

```
       106 DSA                                        4       1007 CHAITREYA
BHELKAR         M        102
       106 DSA                                        4       1009 VIRAT
KOHLI               M
       108 COMPUTER PROGRAMMING                       2       1001 Albert
DCosta             M        101
       108 COMPUTER PROGRAMMING                       2       1002 Foster
Silva              M        102
       108 COMPUTER PROGRAMMING                       2       1003 Maria
Anderson            F        102
       108 COMPUTER PROGRAMMING                       2       1004 Pamela
Smith              F        101
       108 COMPUTER PROGRAMMING                       2       1005 Indiana
Jones             M
       108 COMPUTER PROGRAMMING                       2       1006 Gaurav
Kedia             M        102
       108 COMPUTER PROGRAMMING                       2       1007 CHAITREYA
BHELKAR         M        102

       CID CNAME                            CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       108 COMPUTER PROGRAMMING                       2       1009 VIRAT
KOHLI               M

56 rows selected.

SQL> SELECT *
  2  FROM COURSE C JOIN PARTICIPANT P
  3  ON C.CID=P.PID;

no 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 Database Management Systems                5       1001 Albert
DCosta             M        101
       101 Database Management Systems                5       1004 Pamela
Smith              F        101
       102 Object-Oriented Systems                    4       1006 Gaurav
Kedia             M        102
       102 Object-Oriented Systems                    4       1007 CHAITREYA
BHELKAR         M        102
       102 Object-Oriented Systems                    4       1002 Foster
Silva              M        102
       102 Object-Oriented Systems                    4       1003 Maria
Anderson            F        102

6 rows selected.

SQL>
```

```
SQL> SELECT * FROM COURSE JOIN PARTICIPANT
  2  ON COURSE.CID=PARTICIPANT.CID;

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       101 Database Management Systems             5       1001 Albert
DCosta             M        101
       101 Database Management Systems             5       1004 Pamela
Smith              F        101
       102 Object-Oriented Systems                 4       1006 Gaurav
Kedia             M        102
       102 Object-Oriented Systems                 4       1007 CHAITREYA
BHELKAR         M        102
       102 Object-Oriented Systems                 4       1002 Foster
Silva              M        102
       102 Object-Oriented Systems                 4       1003 Maria
Anderson            F        102

6 rows selected.


SQL> SELECT * FROM COURSE NATURAL JOIN PARTICIPANT;

       CID CNAME                                CREDIT        PID PNAME
G
---------- ------------------------------ ---------- ---------- ---------
---------------- -
       101 Database Management Systems             5       1001 Albert
DCosta             M
       101 Database Management Systems             5       1004 Pamela
Smith              F
       102 Object-Oriented Systems                 4       1006 Gaurav
Kedia             M
       102 Object-Oriented Systems                 4       1007 CHAITREYA
BHELKAR         M
       102 Object-Oriented Systems                 4       1002 Foster
Silva              M
       102 Object-Oriented Systems                 4       1003 Maria
Anderson            F

6 rows selected.

SQL> SELECT * FROM COURSE LEFT OUTER JOIN PARTICIPANT
  2  ON COURSE.CID=PARTICIPANT.CID;

       CID CNAME                                CREDIT        PID PNAME
G
CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ---------
-
       101 Database Management Systems             5       1001 Albert
DCosta             M
101
```

```
       101 Database Management Systems             5       1004 Pamela
Smith              F
101
       102 Object-Oriented Systems                 4       1006 Gaurav
Kedia            M
102
       102 Object-Oriented Systems                 4       1007 CHAITREYA
BHELKAR         M        102
       102 Object-Oriented Systems                 4       1002 Foster
Silva              M        102
       102 Object-Oriented Systems                 4       1003 Maria
Anderson            F        102
       103 MATHEMATICS                             5
       104 MICROCONTROLLER                         4
       105 MACHINE LEARNING                        3
       106 DSA                                     4
       108 COMPUTER PROGRAMMING                    2

11 rows selected.

SQL> SPOOL OFF;

SQL> SELECT * FROM COURSE1;

       CID CNAME                               CREDIT
---------- ------------------------------ ----------
       101 DBMS                                    5
       102 MATHEMATICS                             5
       103 DAA                                     4
       104 DSA                                     5

SQL> ALTER TABLE COURSE1
  2  ADD PRIMARY KEY (CID);

Table altered.

SQL> CREATE TABLE PARTICIPANT1(
  2  PID NUMBER(4),
  3  PNAME VARCHAR2(25),
  4  GENDER CHAR(1),
  5  CID NUMBER(3),
  6  CONSTRAINT PARTICIPANT1_FK_COURSE_CID FOREIGN KEY
  7  (CID) REFERENCES COURSE1(CID));

Table created.


SQL> CREATE TABLE PARTICIPANT2(
  2  PID NUMBER(4),
  3  PNAME VARCHAR2(25),
  4  GENDER CHAR(1),
  5  CID NUMBER(3),
  6  CONSTRAINT PARTICIPANT2_FK_COURSE_CID FOREIGN KEY
  7  (CID) REFERENCES COURSE1(CID));

Table created.

SQL> INSERT INTO PARTICIPANT1 VALUES(&PID,&PNAME,&GENDER,&CID);
```

```
Enter value for pid: 1001
Enter value for pname: 'Gaurav Kedia'
Enter value for gender: 'M'
Enter value for cid: 101
old   1: INSERT INTO PARTICIPANT1 VALUES(&PID,&PNAME,&GENDER,&CID)
new   1: INSERT INTO PARTICIPANT1 VALUES(1001,'Gaurav Kedia','M',101)

1 row created.

SQL> /
Enter value for pid: 1002
Enter value for pname: 'Parag Dewangan'
Enter value for gender: 'M'
Enter value for cid: 102
old   1: INSERT INTO PARTICIPANT1 VALUES(&PID,&PNAME,&GENDER,&CID)
new   1: INSERT INTO PARTICIPANT1 VALUES(1002,'CHAITREYA
BHELKAR','M',102)

1 row created.

SQL> /
Enter value for pid: 1003
Enter value for pname: 'DEVESH WADHWANI'
Enter value for gender: 'M'
Enter value for cid: 103
old   1: INSERT INTO PARTICIPANT1 VALUES(&PID,&PNAME,&GENDER,&CID)
new   1: INSERT INTO PARTICIPANT1 VALUES(1003,'DEVESH WADHWANI','M',103)

1 row created.

SQL> SELECT * FROM PARTICIPANT1;

       PID PNAME                     G        CID
---------- ------------------------- - ----------
      1001 Gaurav Kedia              M        101
      1002 Parag Dewangan             M        102
      1003 DEVESH WADHWANI            M        103

SQL> INSERT INTO PARTICIPANT2 VALUES(&PID,&PNAME,&GENDER,&CID);
Enter value for pid: 1004
Enter value for pname: 'ALBERT DCOSTA'
Enter value for gender: 'M'
Enter value for cid: 101
old   1: INSERT INTO PARTICIPANT2 VALUES(&PID,&PNAME,&GENDER,&CID)
new   1: INSERT INTO PARTICIPANT2 VALUES(1004,'ALBERT DCOSTA','M',101)

1 row created.

SQL> /
Enter value for pid: 1001
Enter value for pname: 'FOSTER SILVA'
Enter value for gender: 'M'
Enter value for cid: 104
old   1: INSERT INTO PARTICIPANT2 VALUES(&PID,&PNAME,&GENDER,&CID)
new   1: INSERT INTO PARTICIPANT2 VALUES(1001,'FOSTER SILVA','M',104)

1 row created.
```

```
SQL> /
Enter value for pid: 1005
Enter value for pname: 'MARTINA WALES'
Enter value for gender: 'F'
Enter value for cid: 101
old   1: INSERT INTO PARTICIPANT2 VALUES(&PID,&PNAME,&GENDER,&CID)
new   1: INSERT INTO PARTICIPANT2 VALUES(1005,'MARTINA WALES','F',101)

1 row created.
SQL> SET LINESIZE 250;
SQL> SELECT * FROM PARTICIPANT1 CROSS JOIN PARTICIPANT2;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
      1001 Gaurav Kedia              M        101       1004 ALBERT
DCOSTA             M        101
      1001 Gaurav Kedia              M        101       1001 FOSTER SILVA
M        104
      1001 Gaurav Kedia              M        101       1005 MARTINA
WALES              F        101
      1002 Parag Dewangan             M        102       1004 ALBERT
DCOSTA             M        101
      1002 Parag Dewangan             M        102       1001 FOSTER SILVA
M        104
      1002 Parag Dewangan             M        102       1005 MARTINA
WALES              F        101
      1003 DEVESH WADHWANI            M        103       1004 ALBERT
DCOSTA             M        101
      1003 DEVESH WADHWANI            M        103       1001 FOSTER SILVA
M        104
      1003 DEVESH WADHWANI            M        103       1005 MARTINA
WALES              F        101

9 rows selected.


SQL> SELECT * FROM PARTICIPANT1,PARTICIPANT2;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
      1001 Gaurav Kedia              M        101        1004 ALBERT
DCOSTA             M        101
      1001 Gaurav Kedia              M        101       1001 FOSTER SILVA
M        104
      1001 Gaurav Kedia              M        101       1005 MARTINA
WALES              F        101
      1002 Parag Dewangan             M        102       1004 ALBERT
DCOSTA             M        101
      1002 Parag Dewangan             M        102       1001 FOSTER SILVA
M        104
      1002 Parag Dewangan             M        102       1005 MARTINA
WALES              F        101
```

```
      1003 DEVESH WADHWANI           M        103       1004 ALBERT
DCOSTA             M        101
      1003 DEVESH WADHWANI           M        103       1001 FOSTER SILVA
M        104
      1003 DEVESH WADHWANI           M        103       1005 MARTINA
WALES              F        101

9 rows selected.

SQL> SELECT * FROM PARTICIPANT1 P1,PARTICIPANT2 P2
  2  WHERE P1.PID=P2.PID;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
      1001 Gaurav Kedia              M        101        1001 FOSTER SILVA
M        104



SQL> SELECT * FROM PARTICIPANT1 P1 JOIN PARTICIPANT2 P2
  2  ON P1.PID=P2.PID;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
      1001 Gaurav Kedia              M        101       1001 FOSTER SILVA
M        104


SQL> SELECT *
  2  FROM PARTICIPANT1 NATURAL JOIN PARTICIPANT2;

no rows selected

SQL> SELECT *
  2  FROM PARTICIPANT1 P1 LEFT OUTER JOIN PARTICIPANT2 P2
  3  ON P1.PID=P2.PID;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
      1001 Gaurav Kedia              M        101       1001 FOSTER SILVA
M        104
      1003 DEVESH WADHWANI           M        103
      1002 Parag Dewangan            M        102

SQL> SELECT *
  2  FROM PARTICIPANT1 P1, PARTICIPANT2 P2
  3  WHERE P1.PID = P2.PID (+);

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

```
      1001 Gaurav Kedia            M        101       1001 FOSTER SILVA
M        104
      1003 DEVESH WADHWANI          M        103
      1002 Parag Dewangan           M        102

SQL> SELECT *
  2  FROM PARTICIPANT1 P1 RIGHT OUTER JOIN PARTICIPANT2 P2
  3  ON P1.PID = P2.PID;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
      1001 Gaurav Kedia            M        101       1001 FOSTER SILVA
M        104
                                                      1004 ALBERT
DCOSTA             M        101
                                                      1005 MARTINA
WALES              F        101

SQL> SELECT *
  2  FROM PARTICIPANT1 P1, PARTICIPANT2 P2
  3  WHERE P1.PID (+) = P2.PID;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
      1001 Gaurav Kedia            M        101       1001 FOSTER SILVA
M        104
                                                      1004 ALBERT
DCOSTA             M        101
                                                      1005 MARTINA
WALES              F        101

SQL> SELECT *
  2  FROM PARTICIPANT1 P1 FULL OUTER JOIN PARTICIPANT2 P2
  3  ON P1.PID = P2.PID;

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
------------ - ----------
                                                      1004 ALBERT
DCOSTA             M        101
      1001 Gaurav Kedia            M        101       1001 FOSTER SILVA
M        104
                                                      1005 MARTINA
WALES              F        101
      1003 DEVESH WADHWANI          M        103
      1002 Parag Dewangan           M        102

SQL> SELECT *
  2  FROM PARTICIPANT1 P1, PARTICIPANT2 P2
  3  WHERE P1.PID (+) = P2.PID (+);
WHERE P1.PID (+) = P2.PID (+)
                 *
ERROR at line 3:
```

```
ORA-01468: a predicate may reference only one outer-joined table


SQL> SELECT * FROM PARTICIPANT1
  2  UNION
  3  SELECT * FROM PARTICIPANT2;

       PID PNAME                     G        CID
---------- ------------------------- - ----------
      1001 Gaurav Kedia              M        101
      1001 FOSTER SILVA               M        104
      1002 Parag Dewangan             M        102
      1003 DEVESH WADHWANI            M        103
      1004 ALBERT DCOSTA              M        101
      1005 MARTINA WALES              F        101

6 rows selected.

SQL> SELECT * FROM PARTICIPANT1
  2  MINUS
  3  SELECT * FROM PARTICIPANT2;

       PID PNAME                     G        CID
---------- ------------------------- - ----------
      1001 Gaurav Kedia              M        101
      1002 Parag Dewangan             M        102
      1003 DEVESH WADHWANI            M        103

SQL> SELECT * FROM PARTICIPANT1
  2  INTERSECT
  3  SELECT * FROM PARTICIPANT2;

no rows selected

SQL> SELECT * FROM PARTICIPANT1
  2  MINUS (
  3  SELECT * FROM PARTICIPANT1
  4  MINUS
  5  SELECT * FROM PARTICIPANT2
  6  );

no rows selected

SQL> SELECT *
  2  FROM PARTICIPANT1 P1, PARTICIPANT2 P2
  3  WHERE P1.PID (+) = P2.PID
  4  UNION
  5  SELECT *
  6  FROM PARTICIPANT1 P1, PARTICIPANT2 P2
  7  WHERE P1.PID = P2.PID (+);

       PID PNAME                     G        CID        PID PNAME
G        CID
---------- ------------------------- - ---------- ---------- ------------
---------- - ----------
      1001 Gaurav Kedia              M        101       1001 FOSTER SILVA
M        104
      1002 Parag Dewangan             M        102
```

```
      1003 DEVESH WADHWANI           M        103
                                                    1004 ALBERT
DCOSTA             M        101
                                                    1005 MARTINA
WALES              F        101

SQL> SELECT * FROM COURSE;

       CID CNAME                            CREDIT
---------- ------------------------------ ----------
       101 DATABASE MANAGEMENT SYSTEMS             5
       102 OBBJECT ORIENTED PROGRAMMING            5
       103 OPERARING SYSTEM                        4
       104 MATHEMATICS                             5
       105 DAA                                     5
       106 COMPUTER NETWORKS                       4
       107 ENVIRONMENTAL SCIENCE                   3

7 rows selected.

SQL> SELECT * FROM PARTICIPANT;

       PID PNAME                      G         CID
---------- ------------------------- - ----------
      1001 Albert DCosta             M        101
      1002 Foster Silva              M        102
      1003 Maria Anderson            F        102
      1004 Pamela Smith              F        101
      1005 Indiana Jones             M
      1006 Martinez Wales            F        103
      1007 Gaurav Kedia             M        105
      1008 Parag Dewangan            M        101

8 rows selected.


SQL> SELECT * FROM COURSE CROSS JOIN PARTICIPANT;

       CID CNAME                            CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
--------------- - ----------
       101 DATABASE MANAGEMENT SYSTEMS             5       1001 Albert
DCosta             M        101
       101 DATABASE MANAGEMENT SYSTEMS             5       1002 Foster
Silva              M        102
       101 DATABASE MANAGEMENT SYSTEMS             5       1003 Maria
Anderson            F        102
       101 DATABASE MANAGEMENT SYSTEMS             5       1004 Pamela
Smith              F        101
       101 DATABASE MANAGEMENT SYSTEMS             5       1005 Indiana
Jones             M
       101 DATABASE MANAGEMENT SYSTEMS             5       1006 Martinez
Wales            F        103
       101 DATABASE MANAGEMENT SYSTEMS             5       1007 Gaurav
Kedia             M        105
```

```
       101 DATABASE MANAGEMENT SYSTEMS             5       1008 Chaitreya
Bhelkar         M        101
       102 OBBJECT ORIENTED PROGRAMMING            5       1001 Albert
DCosta             M        101
       102 OBBJECT ORIENTED PROGRAMMING            5       1002 Foster
Silva              M        102
       102 OBBJECT ORIENTED PROGRAMMING            5       1003 Maria
Anderson            F        102

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
--------------- - ----------
       102 OBBJECT ORIENTED PROGRAMMING            5       1004 Pamela
Smith              F        101
       102 OBBJECT ORIENTED PROGRAMMING            5       1005 Indiana
Jones              M
       102 OBBJECT ORIENTED PROGRAMMING            5       1006 Martinez
Wales            F        103
       102 OBBJECT ORIENTED PROGRAMMING            5
Kedia            M        105                                 1007 Gaurav
       102 OBBJECT ORIENTED PROGRAMMING            5       1008 Chaitreya
Bhelkar         M        101
       103 OPERARING SYSTEM                        4       1001 Albert
DCosta             M        101
       103 OPERARING SYSTEM                        4       1002 Foster
Silva              M        102
       103 OPERARING SYSTEM                        4       1003 Maria
Anderson            F        102
       103 OPERARING SYSTEM                        4       1004 Pamela
Smith              F        101
       103 OPERARING SYSTEM                        4       1005 Indiana
Jones              M
       103 OPERARING SYSTEM                        4       1006 Martinez
Wales            F        103

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
--------------- - ----------
       103 OPERARING SYSTEM                        4
Kedia            M        105                                 1007 Gaurav
       103 OPERARING SYSTEM                        4       1008 Chaitreya
Bhelkar         M        101
       104 MATHEMATICS                             5       1001 Albert
DCosta             M        101
       104 MATHEMATICS                             5       1002 Foster
Silva              M        102
       104 MATHEMATICS                             5       1003 Maria
Anderson            F        102
       104 MATHEMATICS                             5       1004 Pamela
Smith              F        101
       104 MATHEMATICS                             5       1005 Indiana
Jones              M
       104 MATHEMATICS                             5       1006 Martinez
Wales            F        103
       104 MATHEMATICS                             5
Kedia            M        105                                 1007 Gaurav
```

```
       104 MATHEMATICS                             5       1008 Chaitreya
Bhelkar         M        101
       105 DAA                                     5       1001 Albert
DCosta             M        101

       CID CNAME                             CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       105 DAA                                     5       1002 Foster
Silva              M        102
       105 DAA                                     5       1003 Maria
Anderson            F        102
       105 DAA                                     5       1004 Pamela
Smith              F        101
       105 DAA                                     5       1005 Indiana
Jones              M
       105 DAA                                     5       1006 Martinez
Wales            F        103
       105 DAA                                     5       1007 Gaurav
Kedia            M        105
       105 DAA                                     5       1008 Chaitreya
Bhelkar         M        101
       106 COMPUTER NETWORKS                       4       1001 Albert
DCosta             M        101
       106 COMPUTER NETWORKS                       4       1002 Foster
Silva              M        102
       106 COMPUTER NETWORKS                       4       1003 Maria
Anderson            F        102
       106 COMPUTER NETWORKS                       4       1004 Pamela
Smith              F        101

       CID CNAME                             CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       106 COMPUTER NETWORKS                       4       1005 Indiana
Jones              M
       106 COMPUTER NETWORKS                       4       1006 Martinez
Wales            F        103
       106 COMPUTER NETWORKS                       4       1007 Gaurav
Kedia            M        105
       106 COMPUTER NETWORKS                       4       1008 Chaitreya
Bhelkar         M        101
       107 ENVIRONMENTAL SCIENCE                   3       1001 Albert
DCosta             M        101
       107 ENVIRONMENTAL SCIENCE                   3       1002 Foster
Silva              M        102
       107 ENVIRONMENTAL SCIENCE                   3       1003 Maria
Anderson            F        102
       107 ENVIRONMENTAL SCIENCE                   3       1004 Pamela
Smith              F        101
       107 ENVIRONMENTAL SCIENCE                   3       1005 Indiana
Jones              M
       107 ENVIRONMENTAL SCIENCE                   3       1006 Martinez
Wales            F        103
       107 ENVIRONMENTAL SCIENCE                   3       1007 Gaurav
Kedia            M        105
```

```
       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       107 ENVIRONMENTAL SCIENCE                   3       1008 Chaitreya
Bhelkar         M        101

56 rows selected.

SQL> SELECT *
  2  FROM COURSE, PARTICIPANT;

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       101 DATABASE MANAGEMENT SYSTEMS             5       1001 Albert
DCosta             M        101
       101 DATABASE MANAGEMENT SYSTEMS             5       1002 Foster
Silva              M        102
       101 DATABASE MANAGEMENT SYSTEMS             5       1003 Maria
Anderson            F        102
       101 DATABASE MANAGEMENT SYSTEMS             5       1004 Pamela
Smith              F        101
       101 DATABASE MANAGEMENT SYSTEMS             5       1005 Indiana
Jones             M
       101 DATABASE MANAGEMENT SYSTEMS             5       1006 Martinez
Wales            F        103
       101 DATABASE MANAGEMENT SYSTEMS             5       1007 Gaurav
Kedia            M        105
       101 DATABASE MANAGEMENT SYSTEMS             5       1008 Chaitreya
Bhelkar         M        101
       102 OBBJECT ORIENTED PROGRAMMING            5       1001 Albert
DCosta             M        101
       102 OBBJECT ORIENTED PROGRAMMING            5       1002 Foster
Silva              M        102
       102 OBBJECT ORIENTED PROGRAMMING            5       1003 Maria
Anderson            F        102

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       102 OBBJECT ORIENTED PROGRAMMING            5       1004 Pamela
Smith              F        101
       102 OBBJECT ORIENTED PROGRAMMING            5       1005 Indiana
Jones             M
       102 OBBJECT ORIENTED PROGRAMMING            5       1006 Martinez
Wales            F        103
       102 OBBJECT ORIENTED PROGRAMMING            5       1007 Gaurav
Kedia            M        105
       102 OBBJECT ORIENTED PROGRAMMING            5       1008 Chaitreya
Bhelkar         M        101
       103 OPERARING SYSTEM                        4       1001 Albert
DCosta             M        101
       103 OPERARING SYSTEM                        4       1002 Foster
Silva              M        102
```

```
       103 OPERARING SYSTEM                          4       1003 Maria
Anderson            F        102
       103 OPERARING SYSTEM                          4       1004 Pamela
Smith               F        101
       103 OPERARING SYSTEM                          4       1005 Indiana
Jones               M
       103 OPERARING SYSTEM                          4       1006 Martinez
Wales               F        103

       CID CNAME                               CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       103 OPERARING SYSTEM                          4
                                                             1007 Gaurav
Kedia               M        105
       103 OPERARING SYSTEM                          4       1008 Chaitreya
Bhelkar          M        101
       104 MATHEMATICS                               5       1001 Albert
DCosta              M        101
       104 MATHEMATICS                               5       1002 Foster
Silva               M        102
       104 MATHEMATICS                               5       1003 Maria
Anderson            F        102
       104 MATHEMATICS                               5       1004 Pamela
Smith               F        101
       104 MATHEMATICS                               5       1005 Indiana
Jones               M
       104 MATHEMATICS                               5       1006 Martinez
Wales               F        103
       104 MATHEMATICS                               5
                                                             1007 Gaurav
Kedia               M        105
       104 MATHEMATICS                               5       1008 Chaitreya
Bhelkar          M        101
       105 DAA                                       5       1001 Albert
DCosta              M        101

       CID CNAME                               CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       105 DAA                                       5       1002 Foster
Silva               M        102
       105 DAA                                       5       1003 Maria
Anderson            F        102
       105 DAA                                       5       1004 Pamela
Smith               F        101
       105 DAA                                       5       1005 Indiana
Jones               M
       105 DAA                                       5       1006 Martinez
Wales               F        103
       105 DAA                                       5
                                                             1007 Gaurav
Kedia               M        105
       105 DAA                                       5       1008 Chaitreya
Bhelkar          M        101
       106 COMPUTER NETWORKS                         4       1001 Albert
DCosta              M        101
       106 COMPUTER NETWORKS                         4       1002 Foster
Silva               M        102
```

```
       106 COMPUTER NETWORKS                        4       1003 Maria
Anderson            F        102
       106 COMPUTER NETWORKS                        4       1004 Pamela
Smith               F        101

       CID CNAME                               CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       106 COMPUTER NETWORKS                        4       1005 Indiana
Jones             M
       106 COMPUTER NETWORKS                        4       1006 Martinez
Wales             F        103
       106 COMPUTER NETWORKS                        4
                                                       1007 Gaurav
Kedia             M        105
       106 COMPUTER NETWORKS                        4       1008 Chaitreya
Bhelkar          M        101
       107 ENVIRONMENTAL SCIENCE                    3       1001 Albert
DCosta              M        101
       107 ENVIRONMENTAL SCIENCE                    3       1002 Foster
Silva               M        102
       107 ENVIRONMENTAL SCIENCE                    3       1003 Maria
Anderson            F        102
       107 ENVIRONMENTAL SCIENCE                    3       1004 Pamela
Smith               F        101
       107 ENVIRONMENTAL SCIENCE                    3       1005 Indiana
Jones             M
       107 ENVIRONMENTAL SCIENCE                    3       1006 Martinez
Wales             F        103
       107 ENVIRONMENTAL SCIENCE                    3
                                                       1007 Gaurav
Kedia             M        105

       CID CNAME                               CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       107 ENVIRONMENTAL SCIENCE                    3       1008 Chaitreya
Bhelkar          M        101

56 rows selected.


SQL> SELECT *
  2  FROM COURSE C1 JOIN PARTICIPANT P
  3  ON C1.CID = P.PID;

no rows selected


SQL> SELECT *
  2  FROM COURSE C, PARTICIPANT P
  3  WHERE C.CID = P.PID;

no rows selected

SQL> SELEDCT * FROM COURSE NATURAL JOIN PARTICIPANT;
SP2-0734: unknown command beginning "SELEDCT * ..." - rest of line
ignored.
```

```
SQL> SELECT * FROM COURSE NATURAL JOIN PARTICIPANT;

       CID CNAME                                CREDIT        PID PNAME
G
---------- ------------------------------ ---------- ---------- ---------
---------------- -
       101 DATABASE MANAGEMENT SYSTEMS             5       1001 Albert
DCosta             M
       101 DATABASE MANAGEMENT SYSTEMS             5       1004 Pamela
Smith              F
       101 DATABASE MANAGEMENT SYSTEMS             5       1008 Chaitreya
Bhelkar         M
       102 OBBJECT ORIENTED PROGRAMMING            5       1003 Maria
Anderson            F
       102 OBBJECT ORIENTED PROGRAMMING            5       1002 Foster
Silva              M
       103 OPERARING SYSTEM                        4       1006 Martinez
Wales            F
       105 DAA                                     5       1007 Gaurav
Kedia            M

7 rows selected.

SQL> SELECT *
  2  FROM COURSE C LEFT OUTER JOIN PARTICIPANT P
  3  ON C.CID = P.PID;

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       101 DATABASE MANAGEMENT SYSTEMS             5
       102 OBBJECT ORIENTED PROGRAMMING            5
       103 OPERARING SYSTEM                        4
       104 MATHEMATICS                             5
       105 DAA                                     5
       106 COMPUTER NETWORKS                       4
       107 ENVIRONMENTAL SCIENCE                   3

7 rows selected.

SQL>
SQL> SELECT *
  2  FROM COURSE C, PARTICIPANT P
  3  WHERE C.CID=P.PID(+);

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       101 DATABASE MANAGEMENT SYSTEMS             5
       102 OBBJECT ORIENTED PROGRAMMING            5
       103 OPERARING SYSTEM                        4
       104 MATHEMATICS                             5
       105 DAA                                     5
       106 COMPUTER NETWORKS                       4
       107 ENVIRONMENTAL SCIENCE                   3
```

```
7 rows selected.

SQL> SELECT *
  2  FROM COURSE C RIGHT OUTER JOIN PARTICIPANT P
  3  ON C.CID = P.PID;

       CID CNAME                            CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
                                                       1001 Albert
DCosta             M        101
                                                       1002 Foster
Silva              M        102
                                                       1003 Maria
Anderson            F        102
                                                       1004 Pamela
Smith              F        101
                                                       1005 Indiana
Jones             M
                                                       1006 Martinez
Wales             F        103
                                                       1007 Gaurav
Kedia             M        105
                                                       1008 Chaitreya
Bhelkar          M        101

8 rows selected.

SQL> SELECT *
  2  FROM COURSE C, PARTICIPANT P
  3  WHERE C.CID (+) = P.PID;

       CID CNAME                            CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
                                                       1001 Albert
DCosta             M        101
                                                       1002 Foster
Silva              M        102
                                                       1003 Maria
Anderson            F        102
                                                       1004 Pamela
Smith              F        101
                                                       1005 Indiana
Jones             M
                                                       1006 Martinez
Wales             F        103
                                                       1007 Gaurav
Kedia             M        105
                                                       1008 Chaitreya
Bhelkar          M        101
8 rows selected.

SQL> SELECT *
  2  FROM COURSE C FULL OUTER JOIN PARTICIPANT P
  3  ON C.CID=P.PID;
```

```
       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
                                                          1001 Albert
DCosta             M        101
                                                          1002 Foster
Silva              M        102
                                                          1003 Maria
Anderson            F        102
                                                          1004 Pamela
Smith              F        101
                                                          1005 Indiana
Jones             M
                                                          1006 Martinez
Wales             F        103
                                                          1007 Gaurav
Kedia             M        105
                                                          1008 Chaitreya
Bhelkar          M        101
       103 OPERARING SYSTEM                          4
       101 DATABASE MANAGEMENT SYSTEMS               5
       104 MATHEMATICS                               5

       CID CNAME                                CREDIT        PID PNAME
G        CID
---------- ------------------------------ ---------- ---------- ---------
---------------- - ----------
       106 COMPUTER NETWORKS                         4
       102 OBBJECT ORIENTED PROGRAMMING              5
       105 DAA                                       5
       107 ENVIRONMENTAL SCIENCE                     3

15 rows selected.

SQL> SELECT *
  2  FROM COURSE C, PARTICIPANT P
  3  WHERE C.CID (+) = P.PID (+);
WHERE C.CID (+) = P.PID (+)
                *
ERROR at line 3:
ORA-01468: a predicate may reference only one outer-joined table


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> SPOOL OFF;
```