DATABASE SYSTEMS

Lab Digital Assignment-2

Name: Mirdhula **Course Code: BCSE302P**

Section A

Apply below constraints over the relations and ensure that consistency is maintained in the data.

1. Set primary keys in every relation

```
SQL> alter table bce3466db add constraint Con_PK PRIMARY KEY(emp_id);

Table altered.

SQL> desc bce3466db;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 EMP_ID                                    NOT NULL NUMBER(7)
 F_NAME                                             VARCHAR2(20)
 L_NAME                                             VARCHAR2(20)
 DEPTNO                                             NUMBER(4)
 DEPT_NAME                                          CHAR(20)
 SALARY                                             NUMBER(10)
```

```
SQL> create table dept(dept_no number(5) Constraint dept_pk PRIMARY KEY, dept_name varchar(30),avail number(5));

Table created.

SQL> desc dept;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 DEPT_NO                                   NOT NULL NUMBER(5)
 DEPT_NAME                                          VARCHAR2(30)
 AVAIL                                              NUMBER(5)
```

2. Add foreign keys (referential integrity constraint)

```
SQL> alter table bce3466db ADD CONSTRAINT dept_fk FOREIGN KEY(deptno) references dept(dept_no);

Table altered.

SQL> desc bce3466db;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 EMP_ID                                    NOT NULL NUMBER(7)
 F_NAME                                             VARCHAR2(20)
 L_NAME                                             VARCHAR2(20)
 DEPTNO                                             NUMBER(4)
 DEPT_NAME                                          CHAR(20)
 SALARY                                             NUMBER(10)
```

3. Set a Not Null constraint on a column

```
SQL> alter table bce3466db MODIFY (salary number CONSTRAINT sal_no NOT NULL);

Table altered.

SQL> desc bce3466db;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 EMP_ID                                    NOT NULL NUMBER(7)
 F_NAME                                             VARCHAR2(20)
 L_NAME                                             VARCHAR2(20)
 DEPTNO                                             NUMBER(4)
 DEPT_NAME                                          CHAR(20)
 SALARY                                    NOT NULL NUMBER
```

4. Use check constraint and ensure only certain allowed values are entered in a specific column.

```
SQL> alter table bce3466db ADD CONSTRAINT dept_check CHECK (deptno between 101 and 105);

Table altered.
```

5. Set a column as unique

```
SQL> alter table bce3466db add constraint email_uni UNIQUE(email_id);

Table altered.
```

6. Use of 'On delete cascade'

```
SQL> alter table bce3466db add constraint dept_fk FOREIGN KEY(deptno) references dept(dept_no) ON DELETE CASCADE;

Table altered.
```

SQL DEVELOPER MODE

	CONSTRAINT_NAME	CONSTRAINT_TYPE	SEARCH_CONDITION	R_OWNER	R_TABLE_NAME	R_CONSTRAINT_NAME	DELETE_RULE
1	DEPT_CHECK	Check	deptno between 101 and 105	(null)	(null)	(null)	(null)
2	DEPT_FK	Foreign_Key	(null)	ABC	DEPT	DEPT_PK	CASCADE
3	EMP_PK	Primary_Key	(null)	(null)	(null)	(null)	(null)
4	SAL_NO	Check	"SALARY" IS NOT NULL	(null)	(null)	(null)	(null)

Section B

EMPLOYEE TABLE (12 entries)

```
SQL> SELECT *FROM BCE3466DB;

    EMP_ID NAME                 DEPTNO     SALARY       SSID
---------- -------------------- ---------- ---------- ----------
ADDR
--------------------------------------------------
      2031 Soumya Mishra             101      12000          1
16th Nagar St

      3420 Aditya Tyagi              103      15000          3
63 Valmiki Rd

      2793 Praneesh Sunder           102      14000          2
20 Seaweed Rd


    EMP_ID NAME                 DEPTNO     SALARY       SSID
---------- -------------------- ---------- ---------- ----------
ADDR
--------------------------------------------------
      3201 Claire Sebastian          103      14000          3
11th Church St

      2954 Manish Malhotra           101      13000          1
No.4 Usman Rd

      3003 Amina Faizan              104      21000          4
6th Light West St


    EMP_ID NAME                 DEPTNO     SALARY       SSID
---------- -------------------- ---------- ---------- ----------
ADDR
--------------------------------------------------
      2980 Samiya Murtaza            101      12500          1
19th TPK Nagar

      3478 Shaurya Shah              104      20000          4
611 Chandini Chowk

      3120 Hema Manikandan           102      14000          2
Red Hills St 2


    EMP_ID NAME                 DEPTNO     SALARY       SSID
---------- -------------------- ---------- ---------- ----------
ADDR
--------------------------------------------------
      3340 Diana Dsouza              101      13500          1
98 Airport Rd

      3216 Sweta Mohan               105      17000          5
 63 White Jubliee Hills

      2432 Harish Gyan               105      19000          5
 18th Valmiki St
```

DEPT TABLE

```
SQL> select *from dept;

   DEPT_NO DEPT_NAME                      LOC
---------- ------------------------------ -------------
       101 Accounts                       Delhi
       102 Marketing                      Banglore
       103 Design                         Delhi
       104 Research                       Chennai
       105 Administration                 Hyderabad
```

PROJECT TABLE

```
SQL> SELECT *FROM PROJ3466;

   PROJ_ID PROJ_NAME            LOC
---------- -------------------- --------------
         1 SCOPE                Mumbai
         2 SENSE                New Jersey
         3 SELECT               Delhi
```

EMPLOYYE_PROJECT TABLE

```
     EMPID     PROJID        HRS
---------- ---------- ----------
      2031          2         15
      3420          2         20
      2793          1         25
      3201          3         20
      2954          1         30
      3003          3         20
      2980          1         25
      3478          2         20
      3120          3         30
      3340          2         15
      3216          1         10

     EMPID     PROJID        HRS
---------- ---------- ----------
      2432          3         15

12 rows selected.
```

QUERIES

1. Find the employees who earn the same salary as the minimum salary for each department

```
SQL> select e.name,e.salary,e.deptno from bce3466db e where e.salary =(SELECT MIN(Salary) from bce3466db where
deptno=e.deptno) ORDER BY e.deptno;

NAME                    SALARY     DEPTNO
-------------------- ---------- ----------
Soumya Mishra            12000        101
Praneesh Sunder          14000        102
Hema Manikandan          14000        102
Claire Sebastian         14000        103
Shaurya Shah             20000        104
Sweta Mohan              17000        105
```

2. Retrieve the employees whose salary is greater than average salary of department.

```
SQL> select e.name,e.salary,e.deptno from bce3466db e INNER JOIN(
  2  SELECT deptno, AVG(salary) AS avg_sal FROM bce3466db GROUP BY deptno)
  3  avg ON e.deptno=avg.deptno WHERE e.salary>avg.avg_sal;

NAME                    SALARY     DEPTNO
-------------------- ---------- ----------
Diana Dsouza             13500        101
Manish Malhotra          13000        101
Amina Faizan             21000        104
Harish Gyan              19000        105
Aditya Tyagi             15000        103
```

3. Find out the project name having least number of employees working on it.

```
SQL> select proj_name, no_empl FROM( SELECT p.proj_name, COUNT(ep.empid) as no_empl
  2  FROM proj3466 p LEFT JOIN emp_proj ep on p.proj_id=ep.projid
  3  GROUP BY p.proj_id,p.proj_name ORDER BY no_empl) WHERE ROWNUM=1;

PROJ_NAME               NO_EMPL
-------------------- ----------
SELECT                         4
```

4. Display the names of all employees in department who work more than 10 hours per week on the ‘SCOPE’ project.

```
SQL> select e.name from bce3466db e INNER JOIN emp_proj EP on e.emp_id=ep.empid
  2  INNER JOIN proj3466 p on ep.projid=p.proj_id INNER JOIN dept d on e.deptno=d.dept_no
  3  WHERE p.proj_name='SCOPE' AND ep.hrs>10;

NAME
--------------------
Praneesh Sunder
Manish Malhotra
Samiya Murtaza
```

5. Find the names of all the employees who are directly supervised by ‘Sundar Pichai’.

```
SQL> select e.name from bce3466db e INNER JOIN bce3466db supervisor ON e.ssid=supervisor.emp_id
WHERE supervisor.name='Sundar Pichai';
NAME
--------------------
Amina Faizan
Sundar Pichai
```

6. Find the names and addresses of all employees who work on at least one project located in Mumbai but whose department has no location in Mumbai.

```
SQL> select e.name,e.addr from bce3466db e INNER JOIN emp_proj ep on e.emp_id=ep.empid
  2  INNER JOIN proj3466 p on ep.projid=p.proj_id Inner join dept d on e.deptno=d.dept_no
  3  WHERE p.loc='Mumbai' AND d.loc <> 'Mumbai';

NAME                 ADDR
-------------------- --------------------------------------------------
Praneesh Sunder      20 Seaweed Rd
Manish Malhotra      No.4 Usman Rd
Samiya Murtaza       19th TPK Nagar
Sweta Mohan          63 White Jubliee Hills
```

7. For each project, list the project name and the total hours per week (by all employees) spent on that project

```
SQL> select p.proj_name, SUM(ep.hrs) AS TotalHrsPerWeek FROM proj3466 p
  2  LEFT JOIN emp_proj ep on p.proj_id=ep.projid GROUP BY p.proj_id,p.proj_name;

PROJ_NAME            TOTALHRSPERWEEK
-------------------- ---------------
SELECT                            85
SENSE                             70
SCOPE                             90
```