

## EXERCISE : 2

**AIM :** Implement the following integrity constraints on the following database EMP (Empno, Ename, Job, Salary, Mgr, Comm, Hiredate, Deptno) DEPT(Deptno, Dname, Location)  
a. Primary Key b. Foreign Key c. Unique d. Not NULL e. Check

**Description :**

**Constraints**

### ❖ KEY CONSTRAINTS

- **Super key :** set of one or more attributes that uniquely identifies a tuple in a relation is called as a super key.
- **Candidate key :** minimal set of attributes that uniquely identifies a tuple in a relation is called as a candidate key.
- **Primary key :** it is a key which uniquely identifies a tuple in a relation . the two properties of primary key are unique and not null.
- **Alternate key:** an alternate key is a key that can be work as a primary key .basically it is a candidate key that is not a primary key.
- **Foreign key:** ensure that referential integrity of the data in one table to match values in another table . ensure that the foregin key in the child table match with the primary key in the parent table.

### ❖ INTEGRITY CONSTRAINTS

- **Unique key :** unique key is a set of one or more fields/columns of a table that uniquely identify a record in database table .it is like primary key but it

can accept only one null value and it cannot have duplicate values.

- **Check** : ensures that the value in a field meets a specified condition.
- **Not NULL** : indicates that a field cannot store a NULL value.

#### ❖ Constraints according to the aim :

##### a) Primary Key constraint :

The primary key constraint uniquely identifies each record in a table. They must contain UNIQUE values and cannot contain NULL values. A table can have only ONE primary key and in the table, this primary key can consist of single or multiple columns/fields .

##### Syntax :

Create table table\_name(attribute name domain type primary key , .. );

Or

##### By using alter :

Alter table table\_name add constraint constraint\_name primary key(attribute);

##### Example :

create table dept(deptno int primary key,dname varchar2(20),location varchar2(20));

```
SQL> create table dept(deptno int primary key,dname varchar2(20),location varchar2(20));
Table created.
```

Desc dept;

```
SQL> desc dept;
Name                               Null?    Type
-----
DEPTNO                             NOT NULL NUMBER(38)
DNAME                              VARCHAR2(20)
LOCATION                             VARCHAR2(20)
```

Select \* from dept;

```
SQL> select * from dept;
```

DEPTNO	DNAME	LOCATION
10	accounting	newyork
20	research	dallas
30	sales	chicago
40	operations	boston

### b) Foreign Key Constraint:

The foreign key constraint is used to prevent actions that would destroy links between tables. A foreign key is a field or a collection of fields in one table , that refers to the primary key in another table. The table with the foreign key is called the child table , and the table with the primary key is called the referenced or parent table.

#### Syntax :

Create table table\_name(column domain type ,... , column n domain type n , foreign key(column) , references column in parent table);

#### Example :

create table emp1(empno int primary key,ename varchar2(20),salary number(10),mgr real,comm real,hiredate date,deptno int , foreign key(deptno) references dept);

```
SQL> create table emp1(empno int primary key,ename varchar2(20),salary number(10),mgr real,comm real,hiredate date,deptno int , foreign key(deptno) references dept);  
Table created.
```

Desc emp;

```
SQL> desc emp1;
```

Name	Null?	Type
EMPNO	NOT NULL	NUMBER(38)
ENAME		VARCHAR2(20)
SALARY		NUMBER(10)
MGR		FLOAT(63)
COMM		FLOAT(63)
HIREDATE		DATE
DEPTNO		NUMBER(38)

Select \* from emp;

```
SQL> select * from emp1;
```

EMPNO	ENAME	SALARY	MGR	COMM	HIREDATE
7369	smith	8000	7902	800	17-DEC-80
7499	allen	15000	7698	800	20-FEB-81
7521	ward	15000	7698	600	22-FEB-81
7566	jones	20000	7839	1000	02-APR-81
7782	clark	20000	7839	1500	09-JAN-81
7788	scott	18000	7566	1200	19-APR-82

6 rows selected.

It has two attributes :

## 1. ON DELETE CASCADE :

when a primary key is deleted in the parent table then corresponding data in the child table also gets deleted.

### Syntax :

Create table table\_name(attribute domain type , foreign key(attribute) references parent table ON DELETE CASCADE):

### Example :

```
create table emp1(empno int primary key,ename varchar2(20),salary number(10),mgr real,comm real,hiredate date,deptno int , foreign key(deptno) references dept ON DELETE CASCADE);
```

```
SQL> create table emp1(empno int primary key,ename varchar2(20),salary number(10),mgr real,comm real,hiredate date,deptno int , foreign key(deptno) references dept ON DELETE CASCADE);  
Table created.
```

## 2. ON DELETE SET NULL :

When a primary key and its corresponding tuples gets deleted in parent table and then corresponding records in the child table will have the foreign key field set to null but not get deleted.

### Syntax :

Create table table\_name(attribute domain type , foreign key(attribute) references parent table ON DELETE SET NULL):

### Example :

```
create table emp1(empno int primary key,ename varchar2(20),salary number(10),mgr real,comm real,hiredate date,deptno int , foreign key(deptno) references dept ON DELETE SET NULL);
```

```
SQL> create table emp1(empno int primary key,ename varchar2(20),salary number(10),mgr real,comm real,hiredate date,deptno int , foreign key(deptno) references dept ON DELETE SET NULL);  
Table created.
```

### 3. Unique Key Constraint :

The unique constraint imposes that every value in a column or set of columns be unique. It means that no two rows of a table can have duplicate values in a specified column or set of columns.

**Syntax:**

**While creating table :**

**Syntax :**

Create table table\_name(column domain type unique);

**Example :**

create table dept(deptno int primary key ,dname varchar2(20),location varchar2(20) unique);

```
SQL> create table dept(deptno int primary key ,dname varchar2(20),location varchar2(20) unique);  
Table created.
```

Unique constraint violation :

```
SQL> insert into dept values(10,'accounting','newyork');
1 row created.

SQL> insert into dept values(10,'accounting','newyork');
insert into dept values(10,'accounting','newyork')
*
ERROR at line 1:
ORA-00001: unique constraint (SRI.SYS_C004045) violated
```

**4. NOT NULL:** Indicates that a column cannot store NULL value.

**Syntax :**

Alter table table\_name modify attribute domain type NOT NULL;

**Example :**

Alter table emp modify attribute varchar2(20) NOT NULL;

```
SQL> Alter table emp1 modify ename varchar2(20) NOT NULL;
Table altered.

SQL> desc emp1;
Name                                     Null?    Type
-----
EMPNO                                     NOT NULL NUMBER(38)
ENAME                                     NOT NULL VARCHAR2(20)
SALARY                                    NUMBER(10)
MGR                                       FLOAT(63)
COMM                                       FLOAT(63)
HIREDATE                                  DATE
DEPTNO                                    NUMBER(38)

SQL> insert into emp1 values(7369,' ',10000,7902,800,'17-dec-82',20);
insert into emp1 values(7369,' ',10000,7902,800,'17-dec-82',20)
*
ERROR at line 1:
ORA-02291: integrity constraint (SRI.SYS_C004047) violated - parent key not found
```

```
SQL> insert into emp1 values(7369,' ',10000,7902,800,'17-dec-82',20);
insert into emp1 values(7369,' ',10000,7902,800,'17-dec-82',20)
*
ERROR at line 1:
ORA-00001: unique constraint (SRI.SYS_C004053) violated
```

**5. Check :** Ensures that the value in a column meets a specific condition.

**Syntax :**

Alter table table\_name add constraint constraint\_name check(condition);

**Example :**

Alter table emp add constraint s3 check(salary > 500 and salary < = 20000);

```
SQL> Alter table emp add constraint s3 check(salary > 500 and salary < = 20000);
Table altered.
```

Select \* from emp;



```
SQL> select * from emp1;
```

EMPNO	ENAME	SALARY	MGR	COMM	HIREDATE
DEPTNO					
7521 30	ward	15000	7698	600	22-FEB-81
7566 10	jones	15000	7839	1000	02-APR-81
7788 10	clark	20000	7839	1500	09-JAN-81

### VIVA QUESTIONS

- 1) Define primary key.
- 2) Define foreign key.
- 3) What is the purpose of check and not null constraints.
- 4) How the primary key does differs from a candidate key? How they are similar?