**Create Tables:**

Forgot to create a spool file for this and hence took screenshots for the same(attached in createTables.dox).

CREATE TABLE COMPANY.EMPLOYEE(

Fname VARCHAR (20) ,

Minit VARCHAR (35) ,

Lname VARCHAR (35) ,

Ssn INT (20) ,

Bdate DATE,

Address VARCHAR(50),

Sex VARCHAR(50),

Salary INT (50),

Super\_ssn INT (50),

Dno INT (50),

CONSTRAINT CNAME\_PK PRIMARY KEY(Ssn),

CONSTRAINT CTRY\_FK FOREIGN KEY(Super\_ssn) REFERENCES EMPLOYEE(Ssn)

);

CREATE TABLE COMPANY.DEPARTMENT(

Dname VARCHAR (20) ,

Dnumber INT(5) ,

Mgr\_ssn INT (20) ,

Mgr\_start\_date DATE,

CONSTRAINT DEP\_PK PRIMARY KEY(Dnumber),

CONSTRAINT DEP\_FK FOREIGN KEY(Mgr\_ssn) REFERENCES EMPLOYEE(Ssn)

);

CREATE TABLE COMPANY.DEPT\_LOCATIONS(

Dnumber INT(5) ,

Dlocation VARCHAR(20),

CONSTRAINT DEPloc\_FK FOREIGN KEY(Dnumber) REFERENCES DEPARTMENT(Dnumber)

);

CREATE TABLE COMPANY.PROJECT(

Pname VARCHAR (20) ,

Pnumber INT(2) DEFAULT '' ,

Plocation VARCHAR(20),

Dnum INT(2) ,

CONSTRAINT PRO\_PK PRIMARY KEY(Pnumber) ,

CONSTRAINT PRO\_FK FOREIGN KEY(Dnum) REFERENCES DEPARTMENT(Dnumber)

);

CREATE TABLE COMPANY.WORKS\_ON(

Essn INT (20) ,

Pno INT (2),

Hours DOUBLE(4, 2),

CONSTRAINT wo\_FK FOREIGN KEY(Essn) REFERENCES EMPLOYEE(Ssn),

CONSTRAINT wor\_FK FOREIGN KEY(Pno) REFERENCES PROJECT(Pnumber)

);

CREATE TABLE COMPANY.DEPENDENT(

Essn INT (20) ,

Dependent\_name VARCHAR (20) ,

Sex VARCHAR(2),

Bdate DATE,

Relationship VARCHAR(15),

CONSTRAINT D\_FK FOREIGN KEY(Essn) REFERENCES EMPLOYEE(Ssn)

);

**For item 3.**

Apply the following queries and display the result of each query:

1. Select all the attributes for all employees whose last name is 'Jones' or ‘James’.

Sol] select \* from employee where Lname="Jones" or Lname="James";

1. Select all the attributes for all employees whose first name is 'Kim' or ‘Wilson’.

Sol] select \* from employee where Fname="Kim" or Fname="Wilson";

3. Select the names and Ssn of employees who work on more than one project and

count the total hours that the employees work on.

Sol] select e.Fname,e.Minit,e.Lname,e.Ssn,w.sum(Hours)

From Employee e,works\_on w

Where w.Essn=e.Ssn and count(Pno)>1;

4. For each PROJECT, retrieve the project name, number, and location plus the

number of employees who works on the project.

Sol] select Pnumber, Pname,Plocation, count(\*) FROM project, works\_on WHERE Pnumber = Pno GROUP BY Pnumber, Pname;

5. For each employee who works in department 5 on a project in Houston, retrieve the

employee’s Ssn, first and last names, and the project number, name, and hours for

each project that the employee works on.

Sol] select e.Fname,e.Lname,e.Ssn,p.Pnumber,p.Pname,w.Hours

From Employee e,Project p,Works\_on w

Where e.Ssn=w.Essn and w.Pno=p.Pnumber and p.Dnum=5 and p.Plocation="Houston";

6. Retrieve the last name and first name of all employees who work more than 40

hours per week total (on all their projects).

Sol] SELECT LNAME, FNAME

FROM EMPLOYEE, WORKS\_ON, PROJECT

WHERE SSN=ESSN AND PNO=PNUMBER AND HOURS>40;

7. Select the first and last name of each employee who is a supervisor, plus count the total number of employees supervised by each supervisor.

Sol] select distinct S.Fname,S.Lname,count(\*) from EMPLOYEE AS E, EMPLOYEE AS S WHERE E.Super\_ssn= S.Ssn;

8. For each project determine the total hours that employees work on that project per

week.

Sol] SELECT P.Pname,SUM(HOURS)FROM PROJECT P, WORKS\_ON W WHERE P.PNUMBER=W.PNO GROUP BY P.PNAME;

9. Find which employee has more than 2 dependents.

Sol] SELECT LNAME, FNAME

FROM EMPLOYEE

WHERE (SELECT count(\*)

FROM DEPENDENT

WHERE SSN = ESSN) > 2;

10. Find which employee has more than 1 children.

Sol] SELECT distinct LNAME, FNAME

FROM EMPLOYEE e, dependent d

WHERE e.SSN = d.ESSN and (SELECT count(\*)

FROM DEPENDENT d,employee e

WHERE e.SSN = d.ESSN and relationship="Children") > 1;

11. Find all the employee who works in the department that is located in Atlanta. Select their first name and last name.

Sol]

select e.Fname,e.Lname from

Employee e,department d,dept\_locations l

Where e.Dno=d.Dnumber and d.Dnumber=l.Dnumber and Dlocation="Atlanta";

12. Find all the departments located in Houston and list how many projects are their

under those departments.

Sol] select d.Dname ,count(\*)

From department d,dept\_locations dl,project p

Where dl.Dnumber=d.Dnumber and d.Dnumber=p.Dnum and dlocation="Houston";

**For item 4.**

Apply the following updates (some of the updates will violate integrity constraints).

Document clearly which updates succeeded and which failed, and the kind of integrity

constraint violation that caused it to fail:

1. Insert a record ('Services', 1, '123456789', '11-AUG-2012') into DEPARTMENT.

Sol] This Failed as there is a duplicate primary key entry.

1. Insert a record ('Purchasing', 3, '990110110', '02-FEB-2013') into DEPARTMENT.

Sol] This Failed as there is a duplicate primary key entry.

1. Insert a record ('Customers', 12, '333445555', '14-JAN-2013') into DEPARTMENT.

Sol] INSERT INTO department

VALUES ('Customers', 12, '333445555', '14-JAN-2013') ;

4. Update the Dnumber of the DEP\_LOCATIONS record with Dlocation='Seattle' to

9.

Sol] UPDATE dept\_locations

SET Dnumber =9

WHERE Dlocation = "Seattle";

5.Update the Salary of the EMPLOYEE record with SSN=444444444 to 55000.

Sol] UPDATE employee

SET Salary =55000

WHERE Ssn = 444444444;

6. Insert a record ('Jane', 'B', 'Smith', '666666606', '01-MAR-1980', '3556 W Second

Street,Miami,FL', 'F', 85000, '666666603', 5) into EMPLOYEE.

Sol] INSERT INTO employee

VALUES ('Jane', 'B', 'Smith', '666666606', '01-MAR-1980', '3556 W Second

Street,Miami,FL', 'F', 85000, '666666603', 5);

Fails as there is a duplicate entry.

7. Update the hours of the WORKS\_ON record with Pno=1 for the employee with

SSN='666884444' to 25.

Sol]

8. Delete the EMPLOYEE record with Ssn= '432765098'.

Sol] DELETE FROM employee WHERE Ssn= '432765098';

This fails as there is a foreign key reference.

Delete the DEPARTMENT record with DNUMBER = 9.

Sol] DELETE FROM department WHERE Dnumber= 9;

This fails as there is a foreign key reference.

5. Execute 3 more Insert commands in SQLPLUS that attempt to insert 3 more records,

such that the records **violate the integrity constraints**. Make each of the 3 records

violate a *different type* of integrity constraint. Capture your commands in spool files

for turning in.

Sol] a> This Query violates Entity integrity constraint. As the SSN is a duplicate value.

INSERT INTO employee

VALUES ('Jane', 'B', 'Smith', '666666606', '01-MAR-1980', '3556 W Second

Street,Miami,FL', 'F', 85000, '666666603', 5);

b> This query violates key constraint as the primary key cannot be null.

INSERT INTO department

VALUES ('Customers',null , '333445555', '14-JAN-2013') ;

c> This query fails Referential integrity constraint as Dept does not have Department number as 2.

INSERT INTO EMPLOYEE (FNAME, LNAME, SSN, DNO)

VALUES ('Robert', 'Hatcher', '980760540', 2);

6. Execute a command in SQLPLUS to **delete** a record that violates a referential

integrity constraint. Capture your command in a spool file for turning in.

Sol] DELETE FROM department

WHERE Dnumber=1;

7. Repeat 5, but Insert three new records that **do not violate any integrity constraints**.

Capture your commands in spool files for turning in.

Sol] a>

INSERT INTO employee

VALUES ('Jane', 'B', 'Smith', '6606', '01-MAR-1980', '3556 W Second

Street,Miami,FL', 'F', 85000, '666666603', 5);

b>

INSERT INTO department

VALUES ('Customers',31 , '333445555', '14-JAN-2013') ;

c>

INSERT INTO EMPLOYEE (FNAME, LNAME, SSN, DNO)

VALUES ('Robert', 'Hatcher', '980760540', 1);