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**Vellore Institute of Technology**  
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**CBS 1007 Database System**

**LAB Assignment: II**

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**Using the Tables given, answer the Queries given after the tables :**

**Table Name: Employee**

Attribute	Data type	Constraint
Project Name	Varchar2(15)	Not Null
Project number	Number(5)	Primary key
Project Location	Varchar2(50)	

Department Number	Number(5)	Foreign Key –Department (dep no ) on delete set null
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Attribute	Data Type	Constraint
First Name	Varchar (15)	Not Null
Mid Name	Char(2)	
Last Name	Varchar (15)	Not Null
SSN Number	Char (9)	Primary Key
Birthday	Date	
Address	Varchar (50)	
Sex	Char(1)	Sex In (M,F,m,f)
Salary	Number (7)	Default 800
Supervisor SSN	Char (9)	Foreign Key Employee (SSN) on delete set null
Department number	Number(5)	Foreign key to department number of department table on delete cascade

**Table Name : Department**

Attribute	Data type	Constraint
Department Name	Varchar(15)	Not Null
Department number	INT(5)	Primary key
Manager SSN	Char (9)	Foreign key-Employee (SSN) on delete set null
Manage start date	Date	

**Table Name : Dept\_locations**

Attribute	Data type	Constraint
Department Number	Number(5)	Department (dep no) onDelete Cascade
Department Location	Varchar (15)	

**Table Name: Project**

**Table Name: Works\_On**

**The combination of Employee SSN and Project Number must be a Primary Key**

Attribute	Data type	Constraint
Employee SSN	Char (9)	Foreign Key Employee (SSN) on delete cascade
Project number	INT(5)	Foreign Key project ( Pnumber ) on delete cascade
Hours	Decimal (3,1)	Not null

**Name: Dependent**

The combination of Employee SSN and Dependent Name must be a Primary Key.

Attribute	Datatype	Constraint
Employee	Char (9)	Foreign Key- Employee (SSN) on Delete Cascade
Dependent Name	Varchar(15)	
Sex	Char(1)	Check Sex in (M,F,m,f)
Birthday	Date	
Relationship	Varchar(8)	

**Data for table - Dept\_Locations**

Dep No	D Location
1	Houston
1	Chicago
2	New York
2	San Francisco
3	Salt Lake City
4	Stafford
4	Bellaire
5	Sugarland
5	Houston

**Data for Table - Works\_On**

ESSN	Pno	Hours
123456789	3388	32.5
123456789	1945	7.5
666884444	3388	40.0
453453453	7745	20.0
453453453	2212	20.0
333445555	7745	10.0
333445555	6688	10.0
333445555	4345	35.0
333445555	2212	28.5
999887777	2212	11.5
543216789	2212	17.0
554433221	1945	21.5

**Data for Table - Dependent**

ESSN	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	05-Apr-76	Daughter
333445555	Theodore	M	25-Oct-73	Son
333445555	Joy	F	03-May-48	Spouse

987654321	Abner	M	29-Feb-32	Spouse
123456789	Alice	F	31-Dec-78	Daughter
123456789	Elizabeth	F	05-may-57	Spouse

**Execute the following Query on the Db to display and discuss the integrity constraints violated by any of the following operations**

1. Insert ('Robert', 'F', 'Scott', '943775543', '21-JUN-42', '2365 Newcastle Rd, Bellaire, TX', M, 58000, '888665555', 1 ) into EMPLOYEE.
2. Insert ( '677678989', null, '40.0' ) into WORKS\_ON.
3. Insert ( '453453453', 'John', M, '12-DEC-60', 'SPOUSE' ) into DEPENDENT
4. Delete the WORKS\_ON tuples with ESSN= '333445555'.
5. Modify the MGRSSN and MGRSTARTDATE of the DEPARTMENT tuple with DNUMBER=5 to '123456789' and '01-OCT-88', respectively.

**Alter the tables to**

1. Add Foreign Keys using Alter Table [if not done earlier].
2. Drop Foreign key defined on SuperSSN and add it using Alter table command.
3. Make name of Project as Unique and sex of employee as not null.
4. In the copy table add the columns door no, street, city, State, Continent.
5. Make salary of employee to accept real values.

## Data Entries :-

```
mysql> Use emp
Database changed
mysql> CREATE TABLE Employee (
->     FirstName VARCHAR(15) NOT NULL,
->     MiddleName CHAR(2),
->     LastName VARCHAR(15) NOT NULL,
->     SSN CHAR(9) PRIMARY KEY,
->     Birthday DATE,
->     Address VARCHAR(50),
->     Gender CHAR(1) CHECK (Gender IN ('M','F','m','f')),
->     Salary DECIMAL(7,2) DEFAULT 800.00,
->     SupervisorSSN CHAR(9),
->     DepartmentNumber INT(5),
->     FOREIGN KEY (SupervisorSSN) REFERENCES Employee (SSN) ON DELETE SET NULL);
Query OK, 0 rows affected, 1 warning (0.02 sec)
```

```
mysql> CREATE TABLE Department (
->     DepartmentName VARCHAR(15) NOT NULL,
->     DepartmentNumber INT(5) PRIMARY KEY,
->     ManagerSSN CHAR(9) REFERENCES Employee(SSN) ON DELETE SET NULL,
->     ManagerStartDate DATE
-> );
Query OK, 0 rows affected, 1 warning (0.02 sec)
```

```

mysql> CREATE TABLE Dept_locations (
->   DepartmentNumber INT(5) NOT NULL,
->   DepartmentLocation VARCHAR(15),
->   CONSTRAINT fk_DeptLocations_DepartmentNumber FOREIGN KEY (DepartmentNumber) REFERENCES Department (DepartmentNumber) ON DELETE CASCADE
-> );
Query OK, 0 rows affected, 1 warning (0.02 sec)

mysql> CREATE TABLE Project (
->   ProjectName VARCHAR(15) NOT NULL,
->   ProjectNumber INT(5) PRIMARY KEY,
->   ProjectLocation VARCHAR(50),
->   DepartmentNumber INT(5),
->   CONSTRAINT fk_Project_DepartmentNumber FOREIGN KEY (DepartmentNumber) REFERENCES Department (DepartmentNumber) ON DELETE SET NULL
-> );
Query OK, 0 rows affected, 2 warnings (0.01 sec)

mysql> CREATE TABLE Works_On (
->   EmployeeSSN CHAR(9),
->   ProjectNumber INT(5),
->   Hours DECIMAL(3,1) NOT NULL,
->   PRIMARY KEY (EmployeeSSN, ProjectNumber),
->   FOREIGN KEY (EmployeeSSN) REFERENCES Employee (SSN) ON DELETE CASCADE,
->   FOREIGN KEY (ProjectNumber) REFERENCES Project (ProjectNumber) ON DELETE CASCADE
-> );
Query OK, 0 rows affected, 1 warning (0.02 sec)

mysql> CREATE TABLE Dependent (
->   EmployeeSSN Char(9) NOT NULL,
->   DependentName Varchar(15),
->   Sex Char(1) Check (Sex in ('M','F','m','f')),
->   Birthday Date,
->   Relationship Varchar(8),
->   PRIMARY KEY (EmployeeSSN, DependentName),
->   FOREIGN KEY (EmployeeSSN) REFERENCES Employee (SSN) ON DELETE CASCADE
-> );
Query OK, 0 rows affected (0.02 sec)

```

## ANSWERS

1.

```

mysql> INSERT INTO Employee (FirstName, MiddleName, LastName, SSN, Birthday, Address, Gender, Salary, SupervisorSSN, DepartmentNumber)
-> VALUES ('Robert', 'F', 'Scott', '943775543', '1942-06-21', '2365 Newcastle Rd, Bellaire, TX', 'M', 58000, '888665555', 1);
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('emp'.employee, CONSTRAINT 'employee_ibfk_1' FOREIGN KEY ('SupervisorSSN') REFERENCES 'employee' ('SSN') ON DELETE SET NULL)

```

The SupervisorSSN column, which functions as a foreign key reference to the employee table's SSN column, is the source of the error message, which alerts to a foreign key constraint violation in the employee table.

The error notice implies that the value you are attempting to add to or edit in the SupervisorSSN column of the employee table does not exist in the SSN field

2.

```

mysql> INSERT INTO WORKS_ON (EmployeeSSN, ProjectNumber, Hours)
-> VALUES ('677678989', NULL, '40.0');
ERROR 1048 (23000): Column 'ProjectNumber' cannot be null
mysql> |

```

A NOT NULL constraint on the ProjectNumber column of the WORKS ON table is the integrity constraint that is being broken. The constraint was broken because a value for ProjectNumber was omitted from the INSERT statement, according to the error notice.

3.

```
mysql> INSERT INTO Dependent (EmployeeSSN, DependentName, Sex, Birthday, Relationship)
-> VALUES ('453453453', 'John', 'M', '1960-12-12', 'SPOUSE');
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails
(`emp`.`dependent`, CONSTRAINT `dependent_ibfk_1` FOREIGN KEY (`EmployeeSSN`) REFEREN
CES `employee` (`SSN`) ON DELETE CASCADE)
mysql>
```

The failure of the insertion was caused by a foreign key constraint violation, according to the error notice. The value we are trying to insert into the EmployeeSSN column in the dependent table does not exist in the employee table since the foreign key constraint dependent\_ibfk\_1 references the SSN column in the employee table.

We must verify that the value of EmployeeSSN corresponds to a value already present in the SSN column of the employee table.

4.

```
mysql> DELETE FROM WORKS_ON
-> WHERE EmployeeSSN = '333445555';
Query OK, 0 rows affected (0.00 sec)
```

No violation

5.

```
mysql> UPDATE department
-> SET ManagerSSN = '123456789', ManagerStartDate = '1988-10-01'
-> WHERE DepartmentNumber = 5;
Query OK, 0 rows affected (0.00 sec)
```

No Violation

## Altered table commands :-

1.

```
mysql> ALTER TABLE Employee
-> ADD CONSTRAINT fk_DepartmentNumber
-> FOREIGN KEY (DepartmentNumber) REFERENCES Department(DepartmentNumber) ON DELETE CASCADE;
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

2.

```
mysql> ALTER TABLE employee DROP FOREIGN KEY employee_ibfk_1;
Query OK, 0 rows affected (0.01 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE employee ADD FOREIGN KEY (SupervisorSSN) REFERENCES employee (SSN) ON DELETE SET NULL;
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> |
```

3.

```
ALTER TABLE Project ADD UNIQUE (ProjectName)' at line 1
mysql> ALTER TABLE PROJECT ADD CONSTRAINT unique_project_name UNIQUE (ProjectName);
Query OK, 0 rows affected (0.02 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> ALTER TABLE Employee MODIFY Gender CHAR(1) NOT NULL;
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

4.

```
mysql> ALTER TABLE Employee
-> ADD COLUMN DoorNo VARCHAR(10),
-> ADD COLUMN Street VARCHAR(50),
-> ADD COLUMN City VARCHAR(50),
-> ADD COLUMN State VARCHAR(50),
-> ADD COLUMN Continent VARCHAR(50);
Query OK, 0 rows affected (0.02 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> |
```

5.

```
mysql> ALTER TABLE Employee MODIFY COLUMN Salary REAL;
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

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