CS4.301 Data and Applications Homework 1

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An INSERT on EMPLOYEE that is acceptable

```sql
INSERT INTO EMPLOYEE
    (Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno)
VALUES
    ('Raunak', 'K', 'Seksaria', '444444422', '2005-07-10',
    '456 Maple Ave, Houston, TX', 'M', 60000, '333445555', 5);
-- This insert is acceptable because it provides a unique Ssn and references a valid Supervisor
    (Super_ssn) and Department (Dno).
```

An INSERT on EMPLOYEE that violates the primary key constraint

```sql
INSERT INTO EMPLOYEE
    (Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno)
VALUES
    ('Raunak', 'K', 'Seksaria', '123456789', '1990-01-01',
    '789 Oak St, Houston, TX', 'M', 60000, '333445555', 5);
-- This insert violates the primary key constraint because the Ssn (123456789) already exists
    in the EMPLOYEE table.
```

An INSERT on EMPLOYEE that violates referential integrity constraints

```sql
INSERT INTO EMPLOYEE
    (Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno)
VALUES
    ('Raunak', 'K', 'Seksaria', '999999999', '1990-01-01',
    '111 Cedar St, Houston, TX', 'M', 45000, '111223333', 9);
-- This insert violates referential integrity because the Super_ssn (111223333) does not exist
    in the EMPLOYEE table, nor does the Dno (9) in DEPARTMENT.
```

A DELETE on EMPLOYEE that is acceptable

```sql
-- No Delete in the current table is acceptable without violating referential integrity.
-- However, we can delete the employee that we inserted in the first step because it has no
    entry in tables which have a referential integrity with EMPLOYEE(has no dependent records)
DELETE FROM EMPLOYEE
WHERE Ssn = '444444422';
```

A DELETE on EMPLOYEE that violates referential integrity constraints

```sql
DELETE FROM EMPLOYEE
WHERE Ssn = '333445555';
-- This delete violates referential integrity because the employee with Ssn 333445555 is
    referenced in other tables (e.g., WORKS_ON as a Supervisor).
```

An UPDATE on EMPLOYEE that is acceptable

```sql
UPDATE EMPLOYEE
SET Salary = 65000
WHERE Ssn = '123456789';
-- This update is acceptable as it modifies the Salary of the employee identified by Ssn
    123456789 without violating any constraints.
```

An UPDATE on EMPLOYEE that violates referential integrity constraints

```
UPDATE EMPLOYEE
SET Super_ssn = '111223333'
WHERE Ssn = '123456789';
-- This update violates referential integrity because the new Super_ssn (111223333) does not
    exist in the EMPLOYEE table.
```

An UPDATE on EMPLOYEE that violates the primary key constraint

```
UPDATE EMPLOYEE
SET Ssn = '888665555'
WHERE Ssn = '123456789';
-- This update violates the primary key constraint if Ssn 888665555 already exists in the
    EMPLOYEE table.
```

An INSERT on DEPARTMENT that is acceptable

```
INSERT INTO DEPARTMENT
    (Dname, Dnumber, Mgr_ssn, Mgr_start_date)
VALUES
    ('Marketing', 6, '333445555', '2000-01-01');
-- This insert is acceptable as it provides a unique Dnumber(primary key) and references a
    valid Manager (Mgr_ssn).
```

An INSERT on DEPARTMENT that is NOT acceptable

```
INSERT INTO DEPARTMENT
    (Dname, Dnumber, Mgr_ssn, Mgr_start_date)
VALUES
    ('Legal', 5, '123456789', '2000-01-01');
-- This insert is not acceptable because the Dnumber(primary key) used is not unique and
    aldready exists in the table
```

A DELETE on PROJECT that is acceptable

```
-- Directly deleting any project among the given lists is not acceptable because every project
    has dependencies in WORKS_ON.
-- We can however proceed by deleting dependencies first, and then deleting the project.
DELETE FROM WORKS_ON
WHERE Pno = 10;

DELETE FROM PROJECT
WHERE Pnumber = 10;
```

A DELETE on PROJECT that is NOT acceptable

```
DELETE FROM PROJECT
WHERE Pnumber = 30;
-- This delete is not acceptable if the project with Pnumber 30 is referenced in the WORKS_ON
    table.
```

An UPDATE on WORKS_ON that is acceptable

```
UPDATE WORKS_ON
SET Hours = 40
WHERE Essn = '123456789' AND Pno = 1;
-- This update is acceptable as it modifies the Hours for the specified unique employee and
    project, without changing any of its keys
```

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An UPDATE on WORKS_ON that is NOT acceptable

```
UPDATE WORKS_ON
SET Pno = 50
WHERE Essn = '123456789' AND Pno = 1;
-- This update is not acceptable since Pno 50 does not exist in the PROJECT table, violating
    referential integrity.
```

```
UPDATE WORKS_ON
SET Pno = 50
```