

# Assignment 3 : DBMS

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MIS No.: 612303083 (TY 1, ADS 3)

Q.1 Write the DDL and DML statements for the following. -

DDL - Solution queries:

- Code:

```
-- Each offering of a course (i.e. a section) can have many Teaching assistants;
each teaching assistant is a student. Extend the existing schema(Add/Alter
tables) to accommodate this requirement.
CREATE TABLE TA (
    ID VARCHAR(5),
    course_id VARCHAR(8),
    sec_id VARCHAR(8),
    semester VARCHAR(6) CHECK (semester IN ('Fall' , 'Winter', 'Spring',
'Summer')),
    year NUMERIC(4 , 0 ) CHECK (year > 1701 AND year < 2100),
    FOREIGN KEY (ID)
        REFERENCES student (ID),
    FOREIGN KEY (course_id , sec_id , semester , year)
        REFERENCES section (course_id , sec_id , semester , year)
);
```

- Code:

```
-- According to the existing schema, one student can have only one advisor.
-- Alter the schema to allow a student to have multiple advisors and make sure
that you are able to insert multiple advisors for a student.
DROP TABLE advisor;

CREATE TABLE advisor (
    s_ID VARCHAR(5),
    i_ID VARCHAR(5),
    PRIMARY KEY (s_ID, i_ID),
    FOREIGN KEY (i_ID) REFERENCES instructor(ID),
    FOREIGN KEY (s_ID) REFERENCES student(ID)
);
```

Q.2 Write SQL queries on the modified schema. You will need to insert data to ensure the query results are not empty -

DML and DQL - Solution queries:

- Code:

```
insert into instructor values ('30605', 'Ashok', 'Comp. Sci.', '75000');

insert into advisor values ('00128', '45565');
insert into advisor values ('00128', '98345');
insert into advisor values ('00128', '10101');
insert into advisor values ('00128', '76543');
insert into advisor values ('00128', '30605');
insert into advisor values ('12345', '10101');
insert into advisor values ('12345', '22222');
insert into advisor values ('12345', '45565');
insert into advisor values ('76653', '98345');
insert into advisor values ('76653', '10101');
insert into advisor values ('76653', '22222');
insert into advisor values ('76653', '76543');
```

- Code:

```
-- Find all students who have more than 3 advisors
SELECT s.name
FROM student s
JOIN advisor a ON s.ID = a.s_ID
GROUP BY s.name
HAVING COUNT(a.i_ID) > 3;
```

- Output:

| Result Grid |       |
|-------------|-------|
|             | name  |
| ▶           | Zhang |
|             | Aoi   |

- Code:

```
-- Find all students who are co-advised by Prof. Srinivas and Prof. Ashok.
SELECT s.name
FROM student s
JOIN advisor a1 ON s.ID = a1.s_ID
JOIN instructor i1 ON a1.i_ID = i1.ID
JOIN advisor a2 ON s.ID = a2.s_ID
JOIN instructor i2 ON a2.i_ID = i2.ID
WHERE i1.name = 'Srinivasan' AND i2.name = 'Ashok';
```

- Output:

| Result Grid |       |
|-------------|-------|
|             | name  |
| ▶           | Zhang |

- Code:

```
-- Find students advised by instructors from different departments. etc.
SELECT DISTINCT s.name
FROM student s
JOIN advisor a1 ON s.ID = a1.s_ID
JOIN instructor i1 ON a1.i_ID = i1.ID
JOIN advisor a2 ON s.ID = a2.s_ID
JOIN instructor i2 ON a2.i_ID = i2.ID
WHERE i1.dept_name <> i2.dept_name;
```

- Output:

|   | name    |
|---|---------|
| ▶ | Zhang   |
|   | Shankar |
|   | Aoi     |

### Q.3 Write SQL queries for the following -

DDL - Solution queries:

- Code:

```
-- Delete all information in the database which is more than 10 years old. Add
data as necessary to verify your query.
DELETE FROM takes
WHERE year < YEAR(CURDATE()) - 10;

DELETE FROM teaches
WHERE year < YEAR(CURDATE()) - 10;

DELETE FROM section
WHERE year < YEAR(CURDATE()) - 10;
```

- Code:

```
-- Delete the course CS 101. Any course which has CS 101 as a prereq should
remove CS 101 from its prereq set. Create a cascade constraint to enforce the
above rule, and verify that it is working.
drop table prereq;
```

```
CREATE TABLE prereq (  
    course_id  VARCHAR(8),  
    prereq_id  VARCHAR(8),  
    PRIMARY KEY (course_id),  
    FOREIGN KEY (course_id) REFERENCES course(course_id)  
        ON DELETE CASCADE,  
    FOREIGN KEY (prereq_id) REFERENCES course(course_id)  
        ON DELETE SET NULL  
);  
  
DELETE FROM course WHERE course_id = 'CS101';
```