University
(Task 1) - Documentation

Databases MA2 - MAY.2020

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I.   SQL Queries

Create Schema and Tables

```sql
CREATE SCHEMA University;
```

```sql
USE University;
CREATE TABLE College (
    name CHAR(50),
    main_office CHAR(50),
    phone CHAR(12),
    dean CHAR(50),
    PRIMARY KEY (name)
);
```

```sql
USE University;
CREATE TABLE Department (
    name CHAR(50),
     code_number INT(11),
    main_office CHAR(50),
    phone CHAR(50),
    chairman CHAR(50),
    chairman_start_date DATE,
    PRIMARY KEY (code_number)
);
```

```sql
USE University;
CREATE TABLE Course (
    name CHAR(50),
     code_number INT(11),
    level INT(1),
    credit_hours INT(5),
    description CHAR(100),
```

```sql
    PRIMARY KEY (code_number)
);
```

```sql
USE University;
CREATE TABLE Instructor (
    id INT,
    name CHAR(50),
    office CHAR(50),
    phone CHAR(50),
    inst_rank CHAR(50),
    department_code INT,
    PRIMARY KEY (id),
    FOREIGN KEY (department_code) REFERENCES Department(code_number)
);
```

```sql
USE University;
CREATE TABLE Student (
    id INT,
     name CHAR(50),
    first_name CHAR(50),
    middle_name CHAR(50),
    last_name CHAR(50),
    address CHAR(50),
    phone CHAR(50),
    major_code CHAR(50),
    birth_date DATE,
    department_code INT,
    PRIMARY KEY (id),
    FOREIGN KEY (department_code) REFERENCES Department(code_number)
);
```

```sql
USE University;
CREATE TABLE Classroom (
    id INT,
     building_code INT,
    room_number INT,
    PRIMARY KEY (id)
);
```

```sql
USE University;
CREATE TABLE Section (
```

```
        id INT,
        course_code INT,
        instructor_id INT,
        number INT,
        semester CHAR(50),
        year INT,
        classroom_id INT,
        days_times CHAR(50),
        PRIMARY KEY (id),
        FOREIGN KEY (course_code) REFERENCES Course(code_number),
        FOREIGN KEY (instructor_id) REFERENCES Instructor(id),
        FOREIGN KEY (classroom_id) REFERENCES Classroom(id)
);
```

```
USE University;
CREATE TABLE College_Department (
        college_name CHAR(50),
         department_code INT,
        FOREIGN KEY (college_name) REFERENCES College(name),
        FOREIGN KEY (department_code) REFERENCES Department(code_number)
);
```

```
USE University;
CREATE TABLE Level (
        id INT,
         level_name CHAR(10),
        PRIMARY KEY (id)
);
```

```
USE University;
CREATE TABLE Student_Section (
        section_id INT,
        student_id INT,
         student_grade CHAR(4),
        FOREIGN KEY (section_id) REFERENCES Section(id),
        FOREIGN KEY (student_id) REFERENCES Student(id)
);
```

Make fields UNIQUE

```
USE University;
ALTER TABLE College
ADD UNIQUE (name);
```
_____

```
USE University;
ALTER TABLE Department
ADD UNIQUE (name);
```
_____

```
USE University;
ALTER TABLE Course
ADD FOREIGN KEY (level) REFERENCES Level(id);
```
_____

```
USE University;
ALTER TABLE Course
ADD UNIQUE (name);
```

_____

Add Referential Integrity
_____

```
ALTER TABLE Course
      DROP FOREIGN KEY course_ibfk_1;

ALTER TABLE Course
ADD CONSTRAINT course_ibfk_1 FOREIGN KEY (level)
      REFERENCES level (id)
      ON UPDATE CASCADE
      ON DELETE SET NULL;
```
_____

```
ALTER TABLE Instructor
      DROP FOREIGN KEY instructor_ibfk_1;

ALTER TABLE Instructor
ADD CONSTRAINT instructor_ibfk_1 FOREIGN KEY (department_code)
      REFERENCES Department (code_number)
      ON UPDATE CASCADE
      ON DELETE SET NULL;
```
_____

```
ALTER TABLE Student
      DROP FOREIGN KEY student_ibfk_1;

ALTER TABLE Student
```

```
ADD CONSTRAINT student_ibfk_1 FOREIGN KEY (department_code)
     REFERENCES Department (code_number)
     ON UPDATE CASCADE
     ON DELETE SET NULL;
_____

ALTER TABLE Section
     DROP FOREIGN KEY section_ibfk_1;

ALTER TABLE Section
ADD CONSTRAINT section_ibfk_1 FOREIGN KEY (course_code)
     REFERENCES Course (code_number)
     ON UPDATE CASCADE
     ON DELETE SET NULL;
_____

ALTER TABLE Section
     DROP FOREIGN KEY section_ibfk_2;

ALTER TABLE Section
ADD CONSTRAINT section_ibfk_2 FOREIGN KEY (instructor_id)
     REFERENCES Instructor (id)
     ON UPDATE CASCADE
     ON DELETE SET NULL;
_____

ALTER TABLE Section
     DROP FOREIGN KEY section_ibfk_3;

ALTER TABLE Section
ADD CONSTRAINT section_ibfk_3 FOREIGN KEY (classroom_id)
     REFERENCES Classroom (id)
     ON UPDATE CASCADE
     ON DELETE SET NULL;
_____

ALTER TABLE College_Department
     DROP FOREIGN KEY college_department_ibfk_1;

ALTER TABLE College_Department
ADD CONSTRAINT college_department_ibfk_1 FOREIGN KEY (college_name)
     REFERENCES College (name)
     ON UPDATE CASCADE
     ON DELETE SET NULL;
_____
```

```
ALTER TABLE College_Department
      DROP FOREIGN KEY college_department_ibfk_2;

ALTER TABLE College_Department
ADD CONSTRAINT college_department_ibfk_2 FOREIGN KEY
(department_code)
      REFERENCES Department (code_number)
      ON UPDATE CASCADE
      ON DELETE SET NULL;
_____

ALTER TABLE Student_Section
      DROP FOREIGN KEY student_section_ibfk_1;

ALTER TABLE Student_Section
ADD CONSTRAINT student_section_ibfk_1 FOREIGN KEY (section_id)
      REFERENCES Section (id)
      ON UPDATE CASCADE
      ON DELETE SET NULL;
_____

ALTER TABLE Student_Section
      DROP FOREIGN KEY student_section_ibfk_2;

ALTER TABLE Student_Section
ADD CONSTRAINT student_section_ibfk_2 FOREIGN KEY (student_id)
      REFERENCES Student (id)
      ON UPDATE CASCADE
      ON DELETE SET NULL;
```

_____

Create Users

_____

```
CREATE USER 'paul1'@'%' IDENTIFIED BY 'password';
CREATE USER 'constantin1'@'%' IDENTIFIED BY 'password';
CREATE USER 'marius1'@'%' IDENTIFIED BY 'password';
```
_____

```
GRANT ALL ON *.* TO 'paul1'@'%' WITH GRANT OPTION;
GRANT SELECT ON *.* TO 'constantin1'@'%' WITH GRANT OPTION;
GRANT UPDATE, DELETE ON *.* TO 'marius1'@'%' WITH GRANT OPTION;
```
_____

```
SHOW GRANTS for 'paul1'@'%';
SHOW GRANTS for 'constantin1'@'%';
```

```
SHOW GRANTS for 'marius1'@'%';
SELECT * FROM mysql.user;
```

_____

Create View

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```
USE University;
CREATE VIEW User_role_information AS
      SELECT User, Select_priv, Insert_priv, Update_priv,
Delete_priv, Create_priv
          FROM mysql.user
          WHERE Select_priv = 'Y' OR Insert_priv = 'Y' OR
Update_priv = 'Y' OR Delete_priv = 'Y' OR Create_priv = 'Y';
```

_____

Populate Tables

_____

```
USE University;
INSERT INTO Classroom (id, building_code, room_number) VALUES ('1',
'1001', '1');
INSERT INTO Classroom (id, building_code, room_number) VALUES ('2',
'1002', '16');
INSERT INTO Classroom (id, building_code, room_number) VALUES ('3',
'1003', '17');
INSERT INTO Classroom (id, building_code, room_number) VALUES ('4',
'1004', '24');
INSERT INTO Classroom (id, building_code, room_number) VALUES ('5',
'1005', '36');
```

_____

```
USE University;
INSERT INTO College (name, main_office, phone, dean) VALUES ('Kea1',
'L37', '123456789', 'Jesper N');
INSERT INTO College (name, main_office, phone, dean) VALUES ('Kea2',
'L38', '123456788', 'Maria I');
INSERT INTO College (name, main_office, phone, dean) VALUES ('Kea3',
'L16', '123456787', 'Christian L');
INSERT INTO College (name, main_office, phone, dean) VALUES ('Kea4',
'L98', '123456786', 'Christoffer K');
INSERT INTO College (name, main_office, phone, dean) VALUES ('Kea5',
'L101', '123456781', 'Peter D');
```

_____

```sql
USE University;
INSERT INTO Level (id, level_name) VALUES ('1', 'Freshman');
INSERT INTO Level (id, level_name) VALUES ('2', 'Sophomore');
INSERT INTO Level (id, level_name) VALUES ('3', 'Junior');
INSERT INTO Level (id, level_name) VALUES ('4', 'Senior');
INSERT INTO Level (id, level_name) VALUES ('5', 'MS');
INSERT INTO Level (id, level_name) VALUES ('6', 'PhD');
```
_____

```sql
USE University;
INSERT INTO Course (name, code_number, level, credit_hours,
description) VALUES ('Databases', '1234', '4', '30', 'description
1');
INSERT INTO Course (name, code_number, level, credit_hours,
description) VALUES ('Testing', '1235', '4', '15', 'description 2');
INSERT INTO Course (name, code_number, level, credit_hours,
description) VALUES ('Microservices', '1236', '4', '10', 'description
3');
INSERT INTO Course (name, code_number, level, credit_hours,
description) VALUES ('Android Game', '1237', '3', '15', 'description
4');
INSERT INTO Course (name, code_number, level, credit_hours,
description) VALUES ('Python', '1238', '3', '10', 'description 5');
```
_____

```sql
USE University;
INSERT INTO Department (name, code_number, main_office, phone,
chairman, chairman_start_date) VALUES ('Computer Science', '5678',
'Lygten', '123456789', 'Jakob P', '2015-06-11');
INSERT INTO Department (name, code_number, main_office, phone,
chairman, chairman_start_date) VALUES ('Software Development',
'1678', 'GBG', '123456783', 'Martin M', '2007-10-20');
INSERT INTO Department (name, code_number, main_office, phone,
chairman, chairman_start_date) VALUES ('Web Development', '2678',
'GBG', '123456786', 'Daniel E', '2009-12-30');
INSERT INTO Department (name, code_number, main_office, phone,
chairman, chairman_start_date) VALUES ('IT Security', '3678', 'GBG',
'123456781', 'Mark T', '2008-02-08');
INSERT INTO Department (name, code_number, main_office, phone,
chairman, chairman_start_date) VALUES ('Datamatiker', '4678',
'Lygten', '123456788', 'Thomas S', '2019-07-10');
```
_____

```sql
USE University;
```

```sql
INSERT INTO College_Department (college_name, department_code) VALUES
('Kea1', '1678');
INSERT INTO College_Department (college_name, department_code) VALUES
('Kea2', '2678');
INSERT INTO College_Department (college_name, department_code) VALUES
('Kea3', '3678');
INSERT INTO College_Department (college_name, department_code) VALUES
('Kea1', '4678');
INSERT INTO College_Department (college_name, department_code) VALUES
('Kea1', '5678');
```
_____

```sql
USE University;
INSERT INTO Instructor (id, name, office, phone, inst_rank,
department_code) VALUES ('007', 'Andrea Corradini', 'Norrebro',
'123456789', '1', '1678');
INSERT INTO Instructor (id, name, office, phone, inst_rank,
department_code) VALUES ('012', 'Arturo M', 'Norrebro', '123456787',
'2', '2678');
INSERT INTO Instructor (id, name, office, phone, inst_rank,
department_code) VALUES ('067', 'Christian K', 'Norrebro',
'123456784', '3', '4678');
INSERT INTO Instructor (id, name, office, phone, inst_rank,
department_code) VALUES ('031', 'Kristoffer Mikklas', 'Norrebro',
'123456782', '2', '2678');
INSERT INTO Instructor (id, name, office, phone, inst_rank,
department_code) VALUES ('090', 'Jon', 'Norrebro', '123456781', '5',
'1678');
```
_____

```sql
USE University;
INSERT INTO Section (id, course_code, instructor_id, number,
semester, year, classroom_id, days_times) VALUES ('1', '1234', '7',
'10', '1', '2020', '5', 'TuWeTh 9:00 AM - 12:00 AM');
INSERT INTO Section (id, course_code, instructor_id, number,
semester, year, classroom_id, days_times) VALUES ('2', '1235', '31',
'11', '2', '2018', '1', 'MoTuFr 9:00 AM - 14:00 AM');
INSERT INTO Section (id, course_code, instructor_id, number,
semester, year, classroom_id, days_times) VALUES ('3', '1236', '12',
'12', '3', '2016', '3', 'TuWeTh 9:00 AM - 10:00 AM');
INSERT INTO Section (id, course_code, instructor_id, number,
semester, year, classroom_id, days_times) VALUES ('4', '1237', '67',
'13', '4', '2018', '4', 'MoTuFr 9:00 AM - 14:00 AM');
```

```sql
INSERT INTO Section (id, course_code, instructor_id, number,
semester, year, classroom_id, days_times) VALUES ('5', '1238', '90',
'14', '5', '2019', '1', 'TuWeTh 9:00 AM - 12:00 AM');
```
_____

```sql
USE University;
INSERT INTO Student (id, name, first_name, middle_name, last_name,
address, phone, major_code, birth_date, department_code) VALUES ('1',
'Paul Panaitescu', 'Paul', NULL, 'Panaitescu', 'Albertslund',
'087654321', '1111', '1900-10-20', '1678');
INSERT INTO Student (id, name, first_name, middle_name, last_name,
address, phone, major_code, birth_date, department_code) VALUES ('2',
'Constantin Razvan Tarau', 'Constantin', 'Razvan', 'Tarau',
'Albertslund', '287654321', '1112', '1800-10-20', '1678');
INSERT INTO Student (id, name, first_name, middle_name, last_name,
address, phone, major_code, birth_date, department_code) VALUES ('3',
'Marius Daniel Munteanu', 'Marius', 'Daniel', 'Munteanu',
'Albertslund', '387654321', '1113', '2000-10-20', '2678');
INSERT INTO Student (id, name, first_name, middle_name, last_name,
address, phone, major_code, birth_date, department_code) VALUES ('4',
'Jakob M',  'Jakob', NULL, 'M', 'Norrrebro', '587654321', '1198',
'2015-10-20', '2678');
INSERT INTO Student (id, name, first_name, middle_name, last_name,
address, phone, major_code, birth_date, department_code) VALUES ('5',
'Dragos Andrei Mocanasu', 'Dragos', 'Andrei', 'Mocanasu', 'Valby',
'787654321', '2113', '2100-01-20', '4678');
```
_____

```sql
USE University;
INSERT INTO Student_Section (section_id, student_id, student_grade)
VALUES ('1', '1', '12');
INSERT INTO Student_Section (section_id, student_id, student_grade)
VALUES ('1', '2', '12');
INSERT INTO Student_Section (section_id, student_id, student_grade)
VALUES ('1', '3', '12');
INSERT INTO Student_Section (section_id, student_id, student_grade)
VALUES ('2', '1', '4');
INSERT INTO Student_Section (section_id, student_id, student_grade)
VALUES ('4', '1', '10');
```
_____

II. Screenshots of the database

Classroom

#	id	building_code	room_number
1	1	1001	1
2	2	1002	16
3	3	1003	17
4	4	1004	24
5	5	1005	36
*	NULL	NULL	NULL

Course

#	name	code_number	leve	credit_hours	description
1	Databases	1234	4	30	description 1
2	Testing	1235	4	15	description 2
3	Microservices	1236	4	10	description 3
4	Android Game	1237	3	15	description 4
5	Python	1238	3	10	description 5
*	NULL	NULL	NULL	NULL	NULL

Instructor

#	id	name	office	phone	inst_rank	department_code
1	7	Andrea Corradini	Norrebro	123456789	1	1678
2	12	Arturo M	Norrebro	123456787	2	2678
3	31	Kristoffer Mikklas	Norrebro	123456782	2	2678
4	67	Christian K	Norrebro	123456784	3	4678
5	90	Jon	Norrebro	123456781	5	1678
*	NULL	NULL	NULL	NULL	NULL	NULL

Section

#	id	course_code	instructor_id	numbe	semester	year	classroom_id	days_times
1	1	1234	7	10	1	2020	5	TuWeTh 9:00 AM - 12:00 AM
2	2	1235	31	11	2	2018	1	MoTuFr 9:00 AM - 14:00 AM
3	3	1236	12	12	3	2016	3	TuWeTh 9:00 AM - 10:00 AM
4	4	1237	67	13	4	2018	4	MoTuFr 9:00 AM - 14:00 AM
5	5	1238	90	14	5	2019	1	TuWeTh 9:00 AM - 12:00 AM
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

College_Department

#	college_name	department_code
1	Kea1	1678
2	Kea2	2678
3	Kea3	3678
4	Kea1	4678
5	Kea1	5678

College

#	name	main_office	phone	dean
1	Kea1	L37	123456789	Jesper N
2	Kea2	L38	123456788	Maria I
3	Kea3	L16	123456787	Christian L
4	Kea4	L98	123456786	Christoffer K
5	Kea5	L101	123456781	Peter D
*	NULL	NULL	NULL	NULL

Department

#	name	code_number	main_office	phone	chairman	chairman_start_date
1	Software Developm...	1678	GBG	123456783	Martin M	2007-10-20
2	Web Development	2678	GBG	123456786	Daniel E	2009-12-30
3	IT Security	3678	GBG	123456781	Mark T	2008-02-08
4	Datamatiker	4678	Lygten	123456788	Thomas S	2019-07-10
5	Computer Science	5678	Lygten	123456789	Jakob P	2015-06-11
*	NULL	NULL	NULL	NULL	NULL	NULL

Level

#	id	level_name
1	1	Freshman
2	2	Sophomore
3	3	Junior
4	4	Senior
5	5	MS
6	6	PhD
*	NULL	NULL

Student_Section

#	section_id	student_id	student_grade
1	1	1	12
2	1	2	12
3	1	3	12
4	2	1	4
5	4	1	10

Student

#	id	name	first_name	middle_name	last_name	address	phone	major_code	birth_date	department_code
1	1	Paul Panaitescu	Paul	NULL	Panaitescu	Albertslund	087654321	1111	1900-10-20	1678
2	2	Constantin Razvan Tarau	Constantin	Razvan	Tarau	Albertslund	287654321	1112	1800-10-20	1678
3	3	Marius Daniel Munteanu	Marius	Daniel	Munteanu	Albertslund	387654321	1113	2000-10-20	2678
4	4	Jakob M	Jakob	NULL	M	Norrrebro	587654321	1198	2015-10-20	2678
5	5	Dragos Andrei Mocanasu	Dragos	Andrei	Mocanasu	Valby	787654321	2113	2100-01-20	4678
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL