Final Report Project

Part 2

By: Ryan Jin

Albert Shevchuk

CSC 675 – M. Hasan

SFSU – Spring 2018

```sql
# Creates Database
CREATE DATABASE University

# Switches to desired database
Use University

# Creating Entity Tables
CREATE TABLE Course(
        cid varchar(255),
        cName varchar(255),
        meetingDays varchar(255),
        startTime varchar(255),
        endTime varchar(255),
        primary key (cid)
);

CREATE TABLE Department(
        did varchar(255),
        primary key (did)
);

CREATE TABLE Professor(
        pid varchar(255),
        firstName varchar(255),
        lastName varchar(255),
        email varchar(255),
        primary key (pid)
);

CREATE TABLE Student(
        sid varchar(255),
        firstName varchar(255),
        lastName varchar(255),
        email varchar(255),
        primary key (sid)
);

# Creating Relation Tables
CREATE TABLE Offers(
        did varchar(255),
        cid varchar(255),
        primary key (did, cid),
        foreign key (did) references Department(did),
        foreign key (cid) references Course(cid)
```

```
);

CREATE TABLE Enrolled(
        cid varchar(255),
        sid varchar(255),
        primary key (cid, sid),
        foreign key (cid) references Course(cid),
        foreign key (sid) references Student(sid)
);

CREATE TABLE Instructed(
        cid varchar(255),
        pid varchar(255),
        lastName varchar(255),
        primary key (cid, pid),
        foreign key (cid) references Course(cid),
        foreign key (pid) references Professor(pid)
);

CREATE TABLE Contains(
        did varchar(255),
        pid varchar(255),
        lastName varchar(255),
        primary key (did, pid),
        foreign key (did) references Department(did),
        foreign key (pid) references Professor(pid)
);
```

Creating Indexes

```
CREATE INDEX profFirstName ON Professor(firstName(4));

CREATE INDEX className ON Course(cName(6));

CREATE INDEX studFirstName ON Student(firstName(4));
```

INSERTING DATA INTO DATABASE

Inserting Data Into Professor Table (Computer Science, Mathematics, Physics)
```
INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0001', 'Anthony', 'Souza',
'ajsouza@mail.sfsu.edu');

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0002', 'Maryam', 'Hasan',
'maryamhn@sfsu.edu');
```

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0003', 'William', 'Tsun-Yuk Hsu', 'whsu@sfsu.edu');

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0004', 'Mohammad', 'Kafai', 'kafai@sfsu.edu');

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0005', 'Chun Kit', 'Lai', 'cklai@sfsu.edu');

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0006', 'Daniel', 'Wheeler', 'dwheeler@sfsu.edu');

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0007', 'Weining', 'Man', 'weining@sfsu.edu');

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0008', 'Andrew, 'Carmichael', 'ancarmichael@sfsu.edu');

INSERT INTO Professor (pid, firstName, lastName, email) VALUES ('0009', 'Jeff', 'Greensite', 'greensit@sfsu.edu');

Inserting Data Into Department Table
INSERT INTO Department (did) VALUES ('Computer Science');

INSERT INTO Department (did) VALUES ('Mathematics');

INSERT INTO Department (did) VALUES ('Physics');

Inserting Data Into Course Table
INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('3503', 'MATH 300GW', 'M/W/F', '1:10 PM', '2:00 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('8614', 'MATH 245', 'M/W/F', '8:10 AM', '9:00 AM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('3513', 'MATH 380', 'Tu/Th', '2:10 PM', '3:25 AM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('9868', 'MATH 495', 'Tu/Th', '5:00 PM', '6:15 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('3505', 'MATH 324', 'M/W/F', '8:10 AM', '9:00 AM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('3510', 'MATH 440', 'M/W/F', '11:10 AM', '12:00 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('10118', 'CSC 256', 'Tu/Th', '5:35 PM', '6:50 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('2397', 'CSC 413', 'Tu/Th', '7:00 PM', '8:15 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('10779', 'CSC 675', 'M', '4:10 PM', '6:55 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('7071', 'CSC 775', 'F', '4:10 PM', '6:55 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('5420', 'CSC 412', 'W', '11:10 AM', '1:00 PM');
INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('8574', 'CSC 656', 'Th', '4:10 PM', '6:55 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('8372', 'PHYS 230', 'Tu/Th', '12:35 PM', '1:50 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('3874', 'PHYS 491GW', 'F', '2:10 PM', '4:55 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('3853', 'PHYS 122', 'Tu', '2:00 PM', '4:45 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('8266', 'PHYS 232', 'W', '2:10 PM', '4:55 PM');

INSERT INTO Course (cid, cName, meetingDays, startTime, endTime) VALUES ('3871', 'PHYS 370', 'Tu/Th', '3:35 PM', '4:50 PM');

Inserting Data Into Student Table
INSERT INTO Student (sid, firstName, lastName, email) VALUES ('916132964', 'Kobe', 'Bryant', 'kingmamba@mail.sfsu.edu');

INSERT INTO Student (sid, firstName, lastName, email) VALUES ('916896746', 'Lebron', 'James', 'hairline@mail.sfsu.edu');

INSERT INTO Student (sid, firstName, lastName, email) VALUES ('916789321', 'Stephen', 'Curry', 'thesniper@mail.sfsu.edu');

INSERT INTO Student (sid, firstName, lastName, email) VALUES ('916946327', 'Kevin', 'Durant', 'paycut@mail.sfsu.edu');

INSERT INTO Student (sid, firstName, lastName, email) VALUES ('917147963', 'Draymond', 'Green', 'professionalkickboxer@mail.sfsu.edu');

INSERT INTO Student (sid, firstName, lastName, email) VALUES ('916337951', 'Tiger', 'Woods', 'williteverbethesame@mail.sfsu.edu');

INSERT INTO Student (sid, firstName, lastName, email) VALUES ('916499372', 'Allen', 'Iverson', 'practice@mail.sfsu.edu');

INSERT INTO Student (sid, firstName, lastName, email) VALUES ('000000001', 'Michael', 'Jordan', 'GOAT@mail.sfsu.edu');

 # Inserting Data Into Offers Table

INSERT INTO Offers (did, cid) VALUES ('Computer Science', '8574');

INSERT INTO Offers (did, cid) VALUES ('Computer Science', '7071');

INSERT INTO Offers (did, cid) VALUES ('Computer Science', '5420');

INSERT INTO Offers (did, cid) VALUES ('Computer Science', '2397');

INSERT INTO Offers (did, cid) VALUES ('Computer Science', '10779');

INSERT INTO Offers (did, cid) VALUES ('Computer Science', '10118');

INSERT INTO Offers (did, cid) VALUES ('Mathematics', '3503');

INSERT INTO Offers (did, cid) VALUES ('Mathematics', '3505');

INSERT INTO Offers (did, cid) VALUES ('Mathematics', '3510');

INSERT INTO Offers (did, cid) VALUES ('Mathematics', '3513');

INSERT INTO Offers (did, cid) VALUES ('Mathematics', '8614');

INSERT INTO Offers (did, cid) VALUES ('Mathematics', '9868');

INSERT INTO Offers (did, cid) VALUES ('Physics', '3853');

INSERT INTO Offers (did, cid) VALUES ('Physics', '3871');

INSERT INTO Offers (did, cid) VALUES ('Physics', '3874');

INSERT INTO Offers (did, cid) VALUES ('Physics', '8266');

INSERT INTO Offers (did, cid) VALUES ('Physics', '8372');

 # Inserting Data Into Enrolled Table
INSERT INTO Enrolled (cid, sid) VALUES ('2397', '000000001');

INSERT INTO Enrolled (cid, sid) VALUES ('3853', '000000001');

INSERT INTO Enrolled (cid, sid) VALUES ('9868', '000000001');

INSERT INTO Enrolled (cid, sid) VALUES ('10118', '916132964');

 INSERT INTO Enrolled (cid, sid) VALUES ('3871', '916132964');

INSERT INTO Enrolled (cid, sid) VALUES ('10779', '916896746');

INSERT INTO Enrolled (cid, sid) VALUES ('8266', '916896746');

INSERT INTO Enrolled (cid, sid) VALUES ('3513', '916789321');

INSERT INTO Enrolled (cid, sid) VALUES ('3874', '916789321');

INSERT INTO Enrolled (cid, sid) VALUES ('3874', '916946327');

INSERT INTO Enrolled (cid, sid) VALUES ('7071', '916946327');

INSERT INTO Enrolled (cid, sid) VALUES ('3505', '916946327');

INSERT INTO Enrolled (cid, sid) VALUES ('3510', '917147963');

INSERT INTO Enrolled (cid, sid) VALUES ('2397', '917147963');

INSERT INTO Enrolled (cid, sid) VALUES ('8372', '917147963');

INSERT INTO Enrolled (cid, sid) VALUES ('8372', '916337951');

INSERT INTO Enrolled (cid, sid) VALUES ('10118', '916337951');

INSERT INTO Enrolled (cid, sid) VALUES ('3513', '916337951');

INSERT INTO Enrolled (cid, sid) VALUES ('10779', '916499372');

INSERT INTO Enrolled (cid, sid) VALUES ('3871', '916499372');

INSERT INTO Enrolled (cid, sid) VALUES ('5420', '916499372');

Inserting Data Into Instructed Table
INSERT INTO Instructed (cid, pid, lastName) VALUES ('10118', '0001', 'Souza');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('2397', '0001', 'Souza');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('10779', '0002', 'Hasan');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('7071', '0002', 'Hasan');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('5420', '0003', 'Tsun-Yuk Hsu');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('8574', '0003', 'Tsun-Yuk Hsu');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('3505', '0004', 'Kafai');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('3510', '0004', 'Kafai');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('9868', '0005', 'Lai');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('3513', '0005', 'Lai');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('8614', '0006', 'Wheeler');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('3503', '0006', 'Wheeler');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('8372', '0007', 'Man');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('3874', '0007', 'Man');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('8266', '0008', 'Carmichael');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('3853', '0008', 'Carmichael');

INSERT INTO Instructed (cid, pid, lastName) VALUES ('3871', '0009', 'Greensite');

 # Inserting Data Into Contains Table

INSERT INTO Contains (did, pid, lastName) VALUES ('Computer Science', '0001', 'Souza');

INSERT INTO Contains (did, pid, lastName) VALUES ('Computer Science', '0002', 'Hasan');

INSERT INTO Contains (did, pid, lastName) VALUES ('Computer Science', '0003', 'Tsun-Yuk Hsu');

INSERT INTO Contains (did, pid, lastName) VALUES ('Mathematics', '0004', 'Kafai');

INSERT INTO Contains (did, pid, lastName) VALUES ('Mathematics', '0005', 'Lai');

INSERT INTO Contains (did, pid, lastName) VALUES ('Mathematics', '0006', 'Wheeler');

INSERT INTO Contains (did, pid, lastName) VALUES ('Physics', '0007', 'Man');

INSERT INTO Contains (did, pid, lastName) VALUES ('Physics', '0008', 'Carmichael');

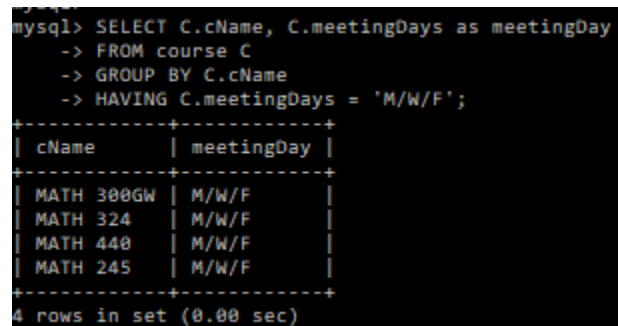INSERT INTO Contains (did, pid, lastName) VALUES ('Physics', '0009', 'Greensite');

SQL Queries

Returns all classes that are offered with meeting days on M/W/F
SELECT C.cName, C.meetingDays AS meetingDay
FROM course C
GROUP BY C.cName
HAVING C.meetingDays = 'M/W/F';

Determines how many professors are teaching computer science
SELECT C.did, COUNT(*)
FROM contains C
GROUP BY C.did
HAVING C.did = 'Computer Science';

```
mysql> SELECT C.did, COUNT(*)
    -> FROM contains C
    -> GROUP BY C.did
    -> HAVING C.did = 'Computer Science';
+------------------+----------+
| did              | COUNT(*) |
+------------------+----------+
| Computer Science |        3 |
+------------------+----------+
```

Returns the first 6 professors according to their Professor ID
SELECT C.lastName, C.pid AS professorID
FROM contains C
GROUP BY C.lastName
HAVING C.pid < '0007';

```
mysql> SELECT C.lastName, C.pid AS professorID
    -> FROM contains C
    -> GROUP BY C.lastName
    -> HAVING C.pid < '0007';
+--------------+-------------+
| lastName     | professorID |
+--------------+-------------+
| Souza        | 0001        |
| Hasan        | 0002        |
| Tsun-Yuk Hsu | 0003        |
| Kafai        | 0004        |
| Lai          | 0005        |
| Wheeler      | 0006        |
+--------------+-------------+
6 rows in set (0.01 sec)
```

Returns all classes enrolled by student with sid = 000000001
SELECT E.sid, E.cid as classesEnrolled
FROM enrolled E
WHERE E.sid = '000000001'

```
mysql> SELECT E.sid, E.cid as classesEnrolled
    -> FROM enrolled E
    -> WHERE E.sid = '000000001';
+-----------+-----------------+
| sid       | classesEnrolled |
+-----------+-----------------+
| 000000001 | 2397            |
| 000000001 | 3853            |
| 000000001 | 9868            |
+-----------+-----------------+
```

Find all course ID's offered by the Computer Science Department

SELECT O.cid

FROM offers O

WHERE O.did IN (SELECT C.did

                          FROM contains C

                          WHERE C.did = 'Computer Science');

```
mysql> SELECT O.cid
    -> FROM offers O
    -> WHERE O.did IN (SELECT C.did
    -> FROM contains C
    -> WHERE C.did = 'Computer Science');
+-------+
| cid   |
+-------+
| 10118 |
| 10779 |
| 2397  |
| 5420  |
| 7071  |
| 8574  |
+-------+
```

Find all course ID's offered by the Physics Department

SELECT O.cid

FROM offers O

WHERE EXISTS (SELECT *

                          FROM contains C

                          WHERE O.did = C.did AND c.did = 'Physics');

```
mysql> SELECT O.cid
    -> FROM offers O
    -> WHERE EXISTS ( SELECT *
    -> FROM contains C
    -> WHERE O.did = C.did AND c.did = 'Physics');
+------+
| cid  |
+------+
| 3853 |
| 3871 |
| 3874 |
| 8266 |
| 8372 |
+------+
```