Project 1.A

I. Project Description

In your first homework, you were asked to design a database that stores some information about a university. Many of you have done an excellent job. Figure 1 shows an ER diagram that is among some good ones.
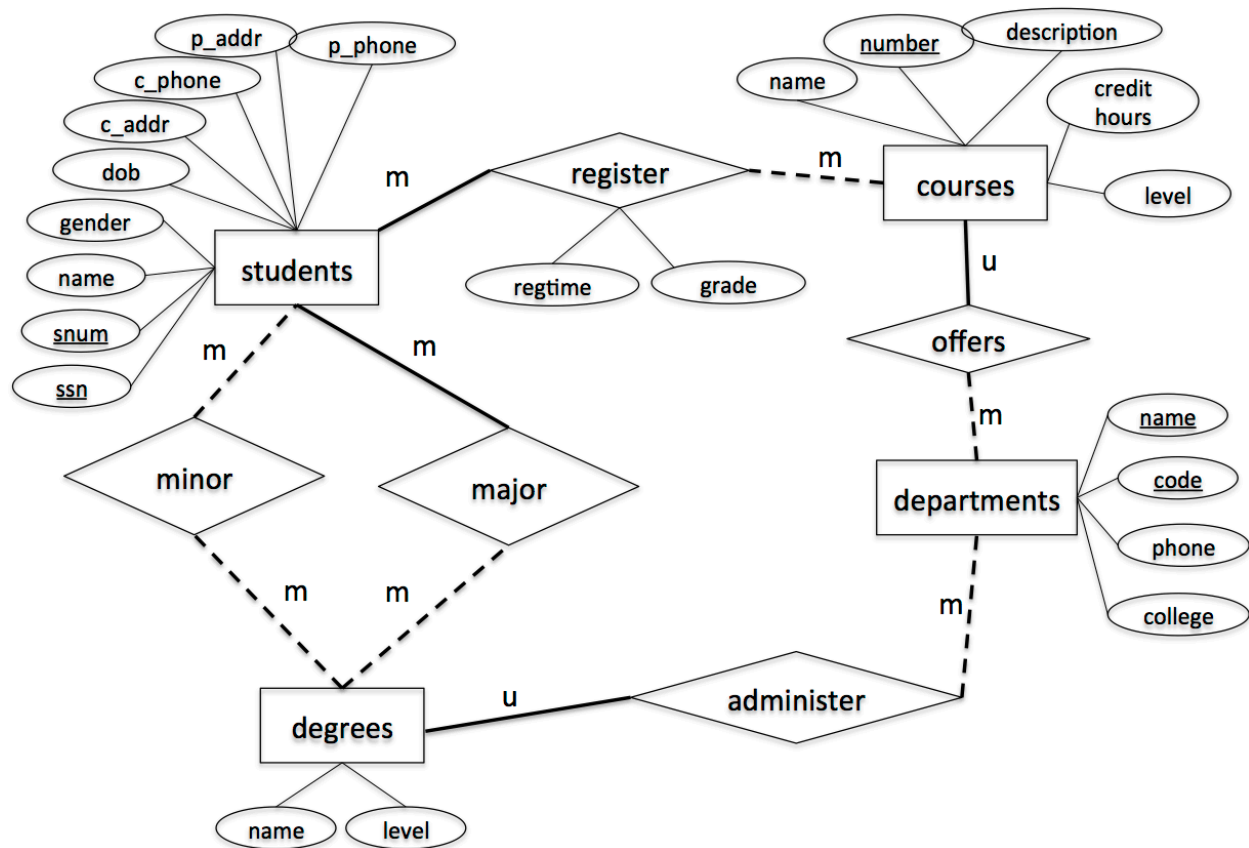

Figure 1. ER-diagram

This project is to implement the above design using a relational data model. Specifically, you are asked to write the following SQL scripts.

1. CreateTables.sql [Points: 15]

This script creates the following tables. Each table must be created with the table name, attribute names and corresponding types and length as specified. Also, make sure to specify primary key, candidate key and foreign key (if any), accordingly.

- students
  a) Attribute, type and length: *snum: integer, ssn: integer, name: varchar(10), gender: varchar(1), dob: datetime, c_addr: varchar(20), c_phone: varchar(10), p_addr: varchar(20), p_phone: varchar(10)*

- b) Primary key: *ssn*
- c) Candidate key: *snum*
- d) Foreign key: *N/A*
- departments
  - a) Attribute, type and length: *code: integer, name: varchar(50), phone: varchar(10), college: varchar(20)*
  - b) Primary key: *code*
  - c) Candidate key: *name*
  - d) Foreign key: *N/A*
- degrees
  - a) Attribute, type and length: *name: varchar(50), level: varchar(5),* department_code: integer
  - b) Primary key: *name, level*
  - c) Candidate key: *N/A*
  - d) Foreign key: *department_code refers to code in table departments*
- courses
  - a) Attribute, type and length: *number: integer, name: varchar(50), description: varchar(50), credithours: integer, level: varchar(20), department_code: integer*
  - b) Primary key: *number*
  - c) Candidate key: *name*
  - d) Foreign key: *department_code refers to code in table departments*
- register
  - a) Attribute, type and length: *snum: integer, course_number: integer, regtime: varchar(20), grade: integer*
  - b) Primary key: *snum, course_number*
  - c) Candidate key: *N/A*
  - d) Foreign key: *snum refers to snum in table students, course_number refers to number in table courses*
- major
  - a) Attribute, type and length: *snum: integer, name: varchar(50), level: varchar(5)*
  - b) Primary key: *snum, name, level*
  - c) Candidate key: *N/A*
  - d) Foreign key: *snum refers to snum in table students, name & level refer to name & level in table degrees*
- minor
  - a) Attribute, type and length: *snum: integer, name: varchar(50), level: varchar(5)*
  - b) Primary key: *snum, name, level*
  - c) Candidate key: *N/A*
  - d) Foreign key: *snum refers to snum in table students, name & level refer to name & level in table degrees*

2. InsertRecords.sql [Points: 15]

This script inserts the following records to the appropriate tables created by CreateTables.sql.

- **students**

snum	ssn	name	gender	dob	c_addr	c_phone	p_addr	p_phone
1001	654651234	Randy	M	2000/12/01	301 E Hall	5152700988	121 Main	7083066321
1002	123097834	Victor	M	2000/05/06	270 W Hall	5151234578	702 Walnut	7080366333
1003	978012431	John	M	1999/07/08	201 W Hall	5154132805	888 University	5152012011
1004	746897816	Seth	M	1998/12/30	199 N Hall	5158891504	21 Green	5154132907
1005	186032894	Nicole	F	2001/04/01	178 S Hall	5158891155	13 Gray	5157162071
1006	534218752	Becky	F	2001/05/16	12 N Hall	5157083698	189 Clark	2034367632
1007	432609519	Kevin	M	2000/08/12	75 E Hall	5157082497	89 National	7182340772

- **departments**

z	name	phone	college
401	Computer Science	5152982801	LAS
402	Mathematics	5152982802	LAS
403	Chemical Engineering	5152982803	Engineering
404	Landscape Architect	5152982804	Design

- **degrees**

name	level	department_code
Computer Science	BS	401
Software Engineering	BS	401
Computer Science	MS	401
Computer Science	PhD	401
Applied Mathematics	MS	402
Chemical Engineering	BS	403
Landscape Architect	BS	404

- **major**

snum	name	level
1001	Computer Science	BS
1002	Software Engineering	BS
1003	Chemical Engineering	BS
1004	Landscape Architect	BS

1005	Computer Science	MS
1006	Applied Mathematics	MS
1007	Computer Science	PhD

- **minor**

snum	name	level
1007	Applied Mathematics	MS
1005	Applied Mathematics	MS
1001	Software Engineering	BS

- **courses**

number	name	description	credithours	level	department_code
113	Spreadsheet	Microsoft Excel and Access	3	Undergraduate	401
311	Algorithm	Design and Analysis	3	Undergraduate	401
531	Theory of Computation	Theorem and Probability	3	Graduate	401
363	Database	Design Principle	3	Undergraduate	401
412	Water Management	Water Management	3	Undergraduate	404
228	Special Topics	Interesting Topics about CE	3	Undergraduate	403
101	Calculus	Limit and Derivative	4	Undergraduate	402

- **register**

snum	course_number	regtime	grade
1001	363	Fall2020	3
1002	311	Fall2020	4
1003	228	Fall2020	4
1004	363	Spring2021	3
1005	531	Spring2021	4
1006	363	Fall2020	3
1007	531	Spring2021	4

3. Query.sql [Points: 55]

This script prints out the following information

1) The student number and ssn of the student whose name is "Becky"
2) The major name and major level of the student whose ssn is 123097834
3) The names of all courses offered by the department of Computer Science
4) All degree names and levels offered by the department Computer Science
5) The names of all students who have a minor
6) The count of students who have a minor
7) The names and snums of all students enrolled in course "Algorithm"
8) The name and snum of the oldest student
9) The name and snum of the youngest student
10) The name, snum and SSN of the students whose name contains letter "n" or "N"
11) The name, snum and SSN of the students whose name does not contain letter "n" or "N"
12) The course number, name and the number of students registered for each course
13) The name of the students enrolled in Fall2020 semester.
14) The course numbers and names of all courses offered by Department of Computer Science
15) The course numbers and names of all courses offered by either Department of Computer Science or Department of Landscape Architect.

4. ModifyRecords.sql [10]

This script modify the following information

1) Change the name of the student with ssn = 746897816 to Scott
2) Change the major of the student with ssn = 746897816 to Computer Science, Master.
3) Delete all registration records that were in "Spring2021",

5. DropTables.sql [5]

This script deletes all tables.

Submission Instruction

II. Developing and Testing Your Code

Use MySQL server and MySQL Workbench (client) to develop and test your code. You can download MySQL server at https://dev.mysql.com/downloads/windows/installer/5.7.html, and MySQL Workbench at https://dev.mysql.com/downloads/workbench. You may need to cut and paste the two links to your browser. After you get the installation files, install them on your computer. Make sure that you download the version that correctly matches you operating system. Follow this link (https://www.youtube.com/watch?v=OWfq_JlvJxM) to specify connection parameters and create a connection.