**Project 1.A** Project Description

In your first homework, you were asked to design a database that stores some information about a university. This project is to implement that 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
  1. 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)*
  2. Primary key: *ssn*
  3. Candidate key: *snum*
  4. Foreign key: *N/A*
* departments
  1. Attribute, type and length: *code: integer, name: varchar(50), phone: varchar(10), college: varchar(20)*
  2. Primary key: *code*
  3. Candidate key: *name*
  4. Foreign key: *N/A*
* degrees
  1. Attribute, type and length: *name: varchar(50), level: varchar(5),* department\_code: integer
  2. Primary key: *name, level*
  3. Candidate key: *N/A*
  4. Foreign key: *department\_code refers to code in table departments*
* courses

1. Attribute, type and length: *number: integer, name: varchar(50), description: varchar(50), credithours: integer, level: varchar(20), department\_code: integer*
2. Primary key: *number*
3. Candidate key: *N/A*
4. Foreign key: *department\_code refers to code in table departments*

* register

1. Attribute, type and length: *snum: integer, course\_number: integer, regtime: varchar(20), grade: integer*
2. Primary key: *snum, course\_number*
3. Candidate key: *N/A*
4. Foreign key: *snum refers to snum in table students, course\_number refers to number in table courses*

* major

1. Attribute, type and length: *snum: integer, name: varchar(50), level: varchar(5)*
2. Primary key: *snum, name, level*
3. Candidate key: *N/A*
4. Foreign key: *snum refers to snum in table students, name & level refer to name & level in table degrees*

* minor

1. Attribute, type and length: *snum: integer, name: varchar(50), level: varchar(5)*
2. Primary key: *snum, name, level*
3. Candidate key: *N/A*
4. Foreign key: *snum refers to snum in table students, name & level refer to name & level in table degrees*
5. **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 | Kevin | 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**

|  |  |  |  |
| --- | --- | --- | --- |
| **code** | **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 |
| 1006 | 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 |
| 102 | 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 |

1. **Query.sql [Points: 55]**

This script prints out the following information

* 1. (2pts) The campus addresses of the students whose name is "Kevin"
  2. (4pts) The major name and major level of the students whose name is "Kevin"
  3. (4pts) The numbers and names of all courses offered by the department of Computer Science, order by course number
  4. (4pts) The name of the students enrolled in Fall2020 semester.
  5. (4pts) All degree names and levels offered by the department Computer Science, order by degree level
  6. (4pts) The snum and names of all students who have a minor, order by student snum
  7. (4pts) The names and snums of all non-undergraduate students enrolled in course “database”, order by snum. (“non-undergraduate students” means the major degrees of these students are MS or PhD levels)
  8. (4pts) The name, snum and SSN of the students whose name contains letter “n” or “N”, order by snum
  9. (4pts) The name, snum and SSN of the students whose name is between “Becky” and “Nicole”, order by name
  10. (4pts) The course number, name and the number of students registered for each course, order by course number (if a course has no student registered, the count should be 0)
  11. (5pts) The count of female students who major or minor in Software Engineering degrees at any level
  12. (6pts) The degree name, degree level, and number of students of the most popular majors (I.e., the major with the highest number of students), order by degree name if there is a tie
  13. (6pts) The degree name, degree level, and number of students of the most popular degrees (I.e., the degree program with the highest number of students taking it as major or minor), order by degree name if there is a tie

1. **ModifyRecords.sql [10]**

This script modifies 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”,
4. **DropTables.sql [5]**

This script deletes all tables, and resulting in an empty database.

**Submission Instruction**

*Submit all your scripts to your Canvas account. The sql scripts must be named exactly how its showing below and all the files must be submitted in one run to trigger grading (if you didn’t finish a certain file, submit it as an empty file):*

1. *CreateTables.sql,*
2. *InsertRecords.sql,*
3. *ModifyRecords.sql,*
4. *DropTables.sql.*
5. *Query1.sql,*
6. *Query2.sql,*
7. *Query3.sql,*
8. *Query4.sql,*
9. *Query5.sql,*
10. *Query6.sql,*
11. *Query7.sql,*
12. *Query8.sql,*
13. *Query9.sql,*
14. *Query10.sql,*
15. *Query11.sql,*
16. *Query12.sql,*
17. *Query13.sql.*

**Additional Note: Do not include create database [db] or use [db] commend in any files. You will get immediate feedback after submit all files. You have unlimited attempts.**