The assignment will be graded out of 100 points.

Due Date: Thursday, September 20th, 2018 by 11:59:59 PM

Submission Guidelines:

- The assignment should be submitted via [Blackboard](#).
- The answers must be typed as a document.
- Make sure your name and your student ID are listed in your document.
- Name files as assignment3_<net-id>.<format>
- Accepted document formats are (.pdf, .doc or .docx). If you are using OpenOffice or LibreOffice, make sure to save as .pdf or .doc
- Please do not submit .txt files.
- If there are multiple files in your submission, zip them together as assignment3_<net-id>.zip and submit the .zip file.
- The maximum points one can get in this assignment is 100.
- You may resubmit the assignment at any time. Late submissions will be accepted at a penalty of 10 points per day. Maximum latency is 5 days beyond which a grade of zero will be assigned. This penalty will apply regardless of whether you have other excuses.

Consider the database below that stores student and course information. Answer questions 1, 2 and 3 based on this database.

STUDENT

Name	Student_number	Class	Major
Smith	17	1	CS
Brown	8	2	CS

COURSE

Course_name	Course_number	Credit_hours	Department
Intro to Computer Science	CS1310	4	CS
Data Structures	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS

GRADE_REPORT

Student_number	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A

SECTION

Section_identifier	Course_number	Semester	Year	Instructor
85	MATH2410	Fall	07	King
92	CS1310	Fall	07	Anderson
102	CS3320	Spring	08	Knuth
112	MATH2410	Fall	08	Chang
119	CS1310	Fall	08	Anderson
135	CS3380	Fall	08	Stone

PREREQUISITE

Course_number	Prerequisite_number
CS3380	CS3320
CS3380	MATH2410
CS3320	CS1310

1) What are the referential integrity constraints that should hold on the database above? Write appropriate SQL DDL statements to define the database (Create table statements) **Note: To show referential integrity Use the notation R.(A) --> S.(B) to represent a foreign key from the attribute A of R (the referencing relation) to S (the referenced relation). (30 points)**

2) Specify the following queries in SQL on the database above. (**30 pts.**)

a) Retrieve the names of all students majoring in 'CS' (computer science).
b) Retrieve the names of all courses taught by Professor King in 2007 and 2008.
c) For each section taught by Professor King, retrieve the course number, semester, year, and number of students who took the section.
d) Retrieve the name and transcript of each senior student (Class = 2) majoring in CS. A transcript includes course name, course number, credit hours, semester, year, and grade for each course completed by the student.
e) Retrieve the names and major departments of all straight A students (students who have a grade A in all their courses).
f) Retrieve the names and major departments of all students who do not have any grade of A in any of their courses.

3) Write SQL update statements to do the following on the database shown above. (20 pints)

a) Insert a new student <'Johnson', 25, 1, 'MATH'> in the database.

b) Change the class of student 'Smith' to 2.

c) Insert a new course <'Knowledge Engineering','COSC4390', 3,'COSC'>.

d) Delete the record for the student whose name is 'Smith' and student number is 17.

Consider the snapshot of Employee table from Company database. Answer Questions 4 & 5 based on this table.

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

4) Write SQL statement to create a table EMPLOYEE_BACKUP backup of EMPLOYEE table shown above. (**5 pts.**)

5) Consider the EMPLOYEE table's constraint EMPSUPERFK as follows

CREATE TABLE EMPLOYEE (. . . ,
Dno INT **NOT NULL DEFAULT** 1,
CONSTRAINT EMPSUPERFK
  FOREIGN KEY (SUPERSSN) REFERNCES EMPLOYEE(SSN)
      ON DELETE CASCADE ON UPDATE CASCADE,

Answer the following questions:
a) What happens when the following command is run on the database containing Employee table specified above. (**5 pts**.)

  DELETE FROM EMPLOYEE WHERE LNAME = 'Borg'

b) Is it better to CASCADE or SET NULL in case of EMPSUPERFK constraint ON DELETE? (5 points)

6) List the data types that are allowed for SQL attributes. (**5 pts**.)