Shahjalal University of Science and Technology
Department of Computer Science and Engineering
3rd Year 1st Semester Final Examination **(Session: 2017-18)**
Course Code: **CSE334**   Credits: **2**   Course Title: **Database Lab**
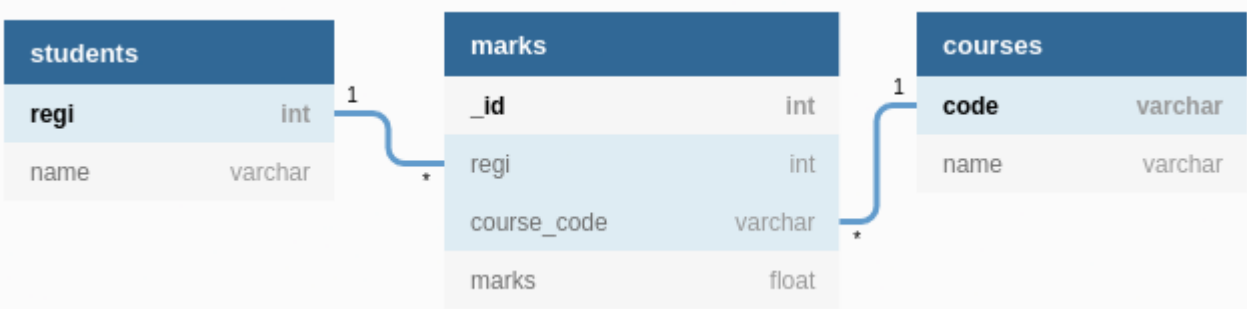Time: **60 Minutes**   Total Marks: **100**

You will find 3 tables created for you in the **test.db** SQLite file named **students, marks,** and **courses**. These tables follow the schema given below.

students	
regi	int
name	varchar

marks	
_id	int
regi	int
course_code	varchar
marks	float

courses	
code	varchar
name	varchar

1. **Write SQL queries for the following.** $5×10 = 50$

Please write your answers in the files **sql_{question_order}.sql**. In case you can not write appropriate SQL queries, you can accomplish the tasks using *python* (with a small penalty, of course). In that case, your answer file name should be **sql_{question_order}.py** or **sql_{question_order}.ipynb**.

a. Show everything in the **courses** table.
b. Show the **mean, minimum** and **maximum** marks obtained by the students in the course with code **CSE333**.
c. Show the **names** and **registration numbers** of students who got **marks>=80** in the course with code **CSE335**.
d. **Count** the number of students who **got less than 40 marks** in the *"Introduction to Data Science"* exam.
e. Join the 3 tables and show an output like below. *Only a portion of the output table is shown below and you do not need to show the results in the exact order of the following table.*

regi	name	code	course_title	marks
2121000001	Adam	CSE331	Software Engineering and Design Patterns	90.0
2121000001	Adam	CSE333	Database Management Systems	97.0
2121000001	Adam	CSE335	Operating Systems	93.5
2121000001	Adam	CSE365	Communication Engineering	96.5
2121000001	Adam	CSE325	Digital Signal Processing	88.5
2121000001	Adam	CSE345	Introduction to Data Science	100.0
2121000002	Alex	CSE331	Software Engineering and Design Patterns	62.0
2121000002	Alex	CSE333	Database Management Systems	37.0
2121000002	Alex	CSE335	Operating Systems	49.5
2121000002	Alex	CSE365	Communication Engineering	44.5
2121000002	Alex	CSE325	Digital Signal Processing	53.5

2. **You are expected to answer the following questions using a mix of SQL and python.** $2×20 = 40$

If you can answer these questions only using SQL, ***then you will get full marks on this test even if you do not answer anything else.***

a. Prepare a **tabulation report** based on the data on tables for **students, marks,** and **courses**. Part of the code is done for you in the file **pysql_a.ipynb,** but you are free to change the code as you wish.

Registration	name	CSE331	CSE333	CSE335	CSE365	CSE325	CSE345
2121000001	Adam	90.000000	97.000000	93.500000	96.500000	88.500000	100.000000
2121000002	Alex	62.000000	37.000000	49.500000	44.500000	53.500000	46.500000
2121000003	Aaron	91.000000	75.000000	83.000000	83.000000	76.000000	91.000000
2121000004	Ben	78.000000	80.000000	79.000000	81.000000	74.000000	77.000000
2121000005	Carl	68.000000	70.000000	69.000000	69.000000	76.000000	67.000000
2121000006	Dan	54.000000	29.000000	41.500000	45.500000	44.500000	35.500000
2121000007	David	62.000000	53.000000	57.500000	60.500000	64.500000	62.500000
2121000008	Edward	60.000000	41.000000	50.500000	55.500000	43.500000	41.500000
2121000009	Fred	53.000000	47.000000	50.000000	46.000000	52.000000	52.000000
2121000010	Frank	33.000000	32.000000	32.500000	33.500000	23.500000	29.500000

b. Compile a **rank list** based on the data on tables **students, marks,** and **courses.** Part of the code is done for you in the file **pysql_a.ipynb.** If student A has a greater **CGPA** than student B, A should appear before B on the rank list. In case A and B both have the same **CGPA**, the student with higher **total marks** should appear before.

    ** You do not need to worry about the CGPA calculation and sorting part. It has already been done for you in the **pysql_b.ipynb** file.

Registration	name	cgpa	total
2121000001	Adam	4.000000	565.500000
2121000083	Tandy	4.000000	557.000000
2121000024	Paul	4.000000	535.000000
2121000068	Ramachandran	4.000000	505.000000
2121000116	Celedon	3.960000	506.000000
2121000032	Victor	3.960000	495.000000
2121000003	Aaron	3.920000	499.000000
2121000078	Sonderling	3.920000	486.000000
2121000120	Darnell	3.880000	488.000000
2121000048	Haworth	3.830000	481.000000
2121000050	Hoffman	3.790000	477.000000
2121000028	Steve	3.790000	476.000000
2121000004	Ben	3.790000	469.000000
2121000075	Shaffer	3.790000	467.000000
2121000150	Lewis	3.750000	467.000000

3. **Thank you for participating in this lab final!**   *10*