LE/EECS 3421 – Introduction to Database Systems

Winter 2022 (Sections N & O)

Assignment # 2

Submission Deadline: March 27, 2022, before 23:59

Application Design and Query Language

Objectives

The purpose of this activity is to practice Database Design using ERDs, Relational Data Model and SQL.

Submission Requirements

- The submission of this assignment will be through Crowdmark where you will upload the solution question by question. You will receive the link to access Crowdmark assignment in your email.
- **Only one student per group is required to submit. If the group has some member from the section O, then submit in section O. If both members are from section N, then submit in section N.**
- Submit solution for each question in its designated place in the form of PDF. In each question write the name of all team members. Solutions uploaded wrongly will not be graded.
- **Please add the statement given in Appendix A in response to Question 6. Both team member must submit this statement separately to their submission on Crowdmark.**
- **Deadline is Sun. March 27, 2022, before 23:59. Late submission is not permitted under any circumstances. Till then you can modify your submission.**
- **Your submissions will be verified using Turnitin (or some other suitable tool) for originality. 60% or more similarity will be awarded zero in the assignment and reported to the department. We may report similarity less than 60% if it is of significant nature.**

Note: In database design, variations are always possible. If the business requirements are taken care of in a proper logical way as per the data modeling guidelines, the answer will be considered correct.

Warning: Please add the necessary headings and labels to your submission so that the TAs can understand the different parts properly. Anything that we cannot understand will be awarded zero.

General Instructions

- **Make sure that your submission is easy to understand; clearly add the question number, part number, captions and foot notes wherever required. If the TA can't locate the answer, then you will get zero.**
- **Make sure that images/screenshots are clear. If the image is big then split it into multiple parts. Clearly write their purpose. You can add multiple images even if the question statement doesn't say so to make sure that your answer is easy to comprehend.**
- **Highlight the significant parts of each image so that TA can easily identify the required answer.**
- **Add necessary explanation to make sure that TA can understand different parts of your submission.**

Question 1: Getting the Database Ready [4 Marks]

Use the SQL scripts (**a02SchemaScript.sql and a02DataScript.sql**) provided with the assignment to prepare the database schema and snapshot. Before you begin, you must make sure that you don't have schema objects with the same names already in your database. Create a schema with the name "**a02schema**". You can use either run script command or copy+paste the code into Workbench and run it.

You are required to:

- Show the list of tables (there should be none) before the above scripts are executed using "SHOW TABLES" and **upload the screenshot to your submission on Crowdmark**.
- Run the **a02SchemaScript.sql** script on your MySQL server. Show the list of tables after the above script is executed using "SHOW TABLES" and **upload the screenshot to your submission on Crowdmark**.
- The SQL statement "SELECT count(*) FROM Some_Table_Name" can be used to see the number of data rows in a table. Show the number of rows in each table and **upload the screenshot(s) to your submission on Crowdmark**.
- Run the **a02DataScript.sql** script on your MySQL server.
- Show the number of rows in each table after executing the script in previous step and **upload the screenshot(s) to your submission on Crowdmark**.

Questions 2-4: Application Design [5 Marks]

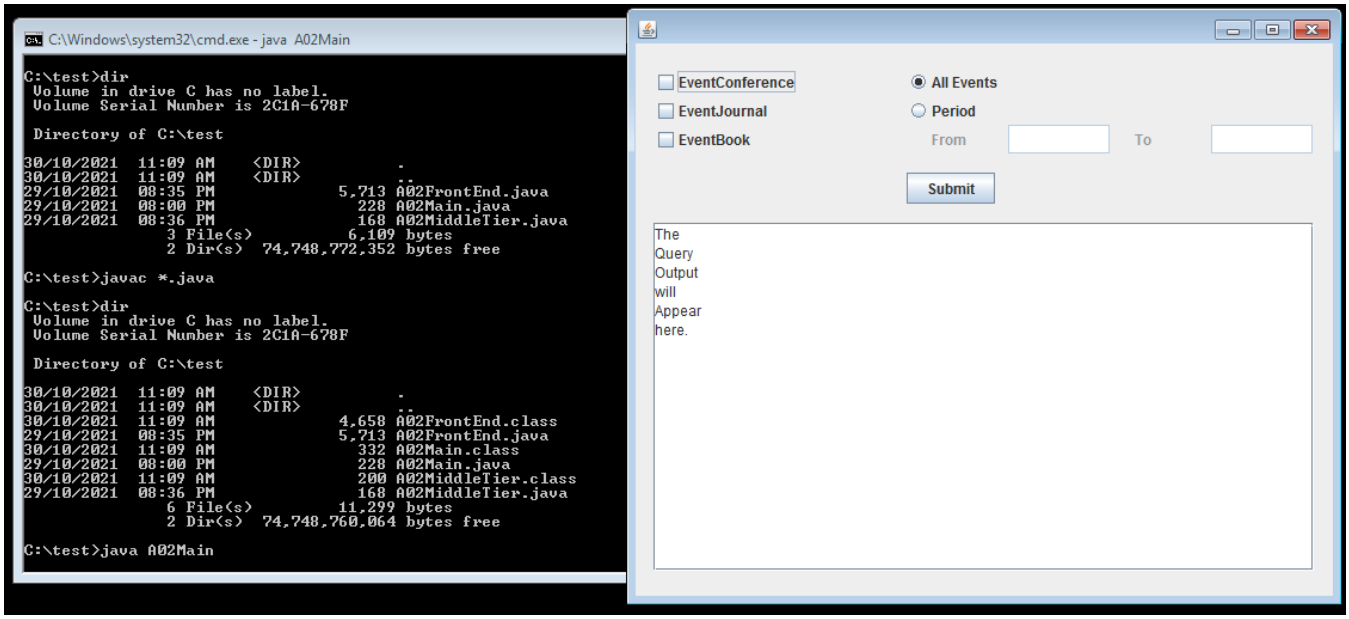
Use the three java files: A02Main.java, A02FrontEnd.java and A02MiddleTier.java.

- The class A02Main is to launch the application and GUI; you do not need to do much in this class.
- The class A02FrontEnd creates the GUI components. In this class you will be writing the suitable action code for the "Submit" button to invoke some suitable function for A02MiddleTier class.
- The class A02MiddleTier is the one where you will be doing most of the work. In this class you will write to code to establish connection with the database and process the query.
- **This assignment requires installation of Java and the "Connector/J" plugin from MySQL. Additionally, you may need to put the mysql connector jar file in the same folder, add it to the classpath and run the program with -cp option.**

Complete the class **A02MiddleTier** to fulfill the following tasks:

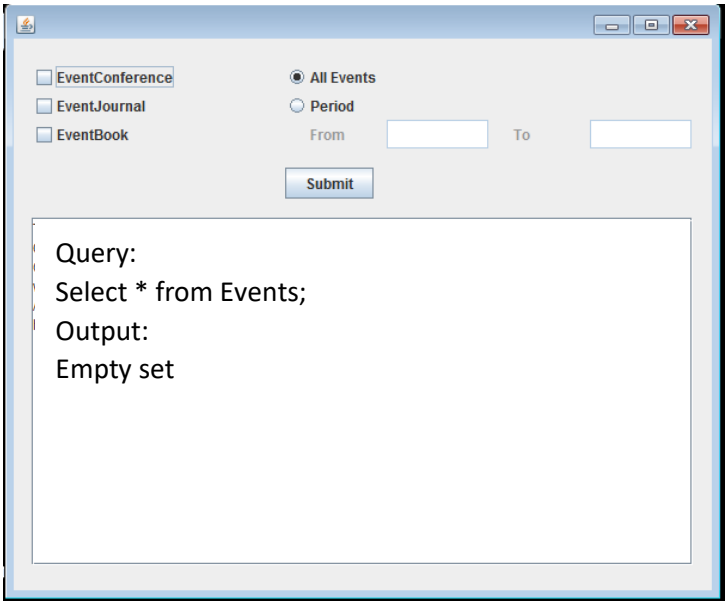
- Establish connection with the database. Please make sure that server port and authentication parameters are as given here: (**IP: 127.0.0.1, Port: 3306, User: root, Password: root1234**)
  - A02FrontEnd must not have any code to connect/query database. It must only be in A02MiddleTier.
  - You can't change the GUI. You can extend/add suitable functions/listeners if required.
  - A02MiddleTier can't directly change the properties of GUI component in A02FronEnd. It must be done using some appropriate indirect approach, either in A02MiddleTier or A02FrontEnd.
- For the "Submit" button clicked event, write suitable code to query the database and then display the result of the query in the given text area. You need to follow the restrictions given below:

- Your code must be able compile from the command line using “javac” from any folder where “javac” is accessible. Your code must be executable from the command line using “java” from any folder where “java” is accessible. See the images below:



How to compile and run the code

- The “From” field is to specify a starting date and “To” field is to specify an end date. These two must be implemented so that we can search for events in a given period of time. The valid date check on the two field is optional to implement and you can assume that date will be provided in a valid format. However, you must show a sample date in both fields to describe the date format used by your application.
- In the output text area, first show the complete SQL query that you have submitted to the Database and then show the output of the query. See the sample below:



- You are not required to format the output of the query; it can be displayed as is in the text area.
- If you feel necessary, you can extend the A02Main to add suitable functionality.
- Submit your three code files in the PDF format in response to Questions 2-4 on the Crowdmark. Submission of these codes is required to get marks in this assignment.
- **If you use any modern IDEs or project types, make sure that you submit only the code for the three files that we have asked for. Do not submit any additional code or files.**

Question 5: Testing and Reporting [16 Marks]

Test your application for all possible use cases. With 3 checkboxes and two radio buttons there are in total 16 variations possible. For each use case you need to figure out the appropriate SQL query to submit to the database and get the output. You will write the necessary code for this in your code files for Q2-4.

Run each use/test case and take the screenshot of it. Submit the screenshots to your submission on Crowdmark. With each screenshot add some description to explain the purpose of that screenshot.

Appendix A

The following statement must be added in your submission in question 6. Each team member must submit her own independent statement. The signature can be electronic, or you can add a scan of statement with handwritten signature.

I ***student_name*** student ID # ***student_id*** acknowledge that I have contributed at least 40% time and effort to the preparation of this report and work discussed herein.

Student_Signature