28 August 2021

Independent University, Bangladesh

CSE213/CSC305: Object Oriented Programming – I

Final Exam; Sections – ALL; Summer – 2021

Total Marks: 100; Duration: 2 hours and 30 minutes for the ENTIRE Exam

- This PDF contains Question-1 (for 60 marks) only.
- PDF containing Question-2 (for 40 marks) will be emailed to you after 1 hour 15 minutes from the commencement of your exam.

Write the following at the top of the first page of your script (mandatory):

- **ID:** 1234567
- **Name:** Abcd Efg
- **CSE213 Final exam, Summer 2021, Section:** secNo
- **Project Title:** your project title

Without the above information on the top page, your script will not be graded.

To-be-uploaded file name must be: "1234567_2_Final.pdf"

Before uploading your scanned answer script, open the file using a PDF reader and make sure that the file is not corrupt/blur.

1) Answer the following: **[60 marks]**

a) **Write a goal** for one of your users of your project who needs to generate a report containing a Table and chart. You need to explain the user inputs needed to generate the report and what will be the content of the generated report. To get any mark, the goal must make sense within the context of your own project topic. **[10 marks]**

For example, for IRAS, a Faculty user wants to see the ratio of studentCount got 'A' grade in different sections of a Course. In that case the course ID, semester and year will be user input (combo boxes), and based on the user input, the report scene will contain grade information of the selected course in a table at the top and a pie chart below that. Number of pie/slices will be the number of sections representing frequency of 'A' grade from those sections of that course offered in that particular semester and year.

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b) **Write workflow** for the above goal. Along with other details, the workflow should: **[10 marks]**

- explain what the columns of the table will be, and how it will load the table rows from the database and by using which files and what those files contain.
- Depending on the chart-type you select (pie/line/bar), what the chart-element (slice/dot/bar) represents.
- What will be the dataset of the chart and how the dataset will be obtained from the database.

For questions C & D:

Now, assume that your controller class (**ReportSceneController.java**) has all necessary fxids to take user input as described in your goal & workflow. The controller class also has a button (fxid: generateTableAndChartButton) to generate the report, and the corresponding event handler method is generateTableAndChartButtonOnClick(). Upon clicking the button, the **generateReportAndChartButtonOnClick()** handler method will load the table and call a model class method (class representing the user for whom generating report is a goal) named **generateAndReturnChartDataSet()** to obtain necessary chart-dataset so that after receiving the dataset from model class method, the handler method can continue to generate the chart on the scene.

c) Now, **write the FULL definition** of the controller class including ALL necessary fields and generateReportAndChartButtonOnClick() method fulfilling requirements of your defined goal and workflow in question 1.a & 1.b. You may avoid writing import statements. **[20 marks]**

d) Also **write the FULL definition** of UserClass (model class) including ALL necessary fields and generateAndReturnChartDataSet() method fulfilling requirements of your defined goal and workflow in question 1.a & 1.b. You may avoid writing import statements. **[20 marks]**

You will **NOT GET (or LOOSE) MARK** for question-1:

- If the User is not relevant to your project
- If the report description is not relevant for the user
- If the workflow for generating the report using user input is not logical
- If the chart dataset is not generated from database by the model-class method
- If the chart is not generated using obtained dataset (from model class method) by the handler method