Final Exam - Software Engineering (Spring 2021)

(PART B)

This is a take-home (timed) exam. It consists of 2 questions (PART A and PART B) worth a total of 30 points.

You have a maximum of 60 minutes to answer Part B (9:45 – 10:45 am). Submission will close by 10:50 am.

The two parts need to be submitted separately!!! Note that the access to the question and the submission itself will remain open only for said timing. So, please ensure you submit on time.

Please read the instructions and questions carefully before you answer the exam.

For all design questions your **UML class diagram must include class names, multiplicities, navigability and a <<stereotype>> designation** of the role the class is playing in the pattern, i.e. the class in the pattern structure diagram. If it is part of multiple patterns there may be more than one stereotype specified. You also should specify **state and behavior** information to cover the requirements stated in the problem.

Credit is given for what you write, not what you are thinking. Partial credit will be given based on content, not quantity.

GOOD LUCK!!!

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Submit it via moodle in the **Final Exam Part B**. The final exam - part B must be submitted by **11:05 AM**.

Only a single pdf file is to be submitted for Part B. So, please ensure your text and figure are in the same document.

PART B (20 points)

Answer the following questions based on this system description.

You are given the task to define the font selection mechanism for a new version of a commercial word processing package. The mechanism will be built on a dialog box that displays (a) the fonts available, (b) the font sizes available, (c) the font weights available (normal, bold, italic, and bold italic), and any special characters available in the font.

The various components are interrelated; that is, a given font may only be available in a restricted set of sizes and weights, a given special character in a font may only be available in some sizes, and a given size may only be available in certain weights. The goal is to update the selections in the dialog box dynamically to reflect the current available options, however, in the worst case, this makes each aspect dependent on all the others.

1. (5 points)

State how the principles of coupling and cohesion impacted your specific design decisions.

2. (5 points)

List the design patterns that you will use in this design. Give each pattern a name that incorporates the name of the pattern and some problem context, such as Pinsetter Observer for a pattern that has the Pinsetter class as its Subject. For each pattern provide a short (2 or 3 sentence) description of how the pattern is used in the context of the problem domain for this system. For each pattern, list all the participants of that pattern. Identify the class or classes within your design that will play that role in the pattern.

3. (10 points)

Draw the design class diagram (using UML) clearly labeling each class, inheritance structure, relationships with navigability and multiplicities.