Metropolitan State University, Saint Paul, Minnesota
ICS 372 Object-Oriented Design and Implementation
Information About Exam 3

Date and Time 6:00 PM (or a few minutes later) on April 29, 2021
Duration: 3 hours (maximum)
Points 100
Topics and Structure All materials covered in lectures 10 through 14 are game for inclusion in the exam.

The exam will contain two questions requiring you to write Java code; there is a question that requires you to create the state transition table for an FSM. Then there is a set of multiple-choice/true-false/multi-select/short-answer questions for a total of 20 points. Please follow the directions carefully, so you don't lose credit.

The exam will be completely administered on D2L. Be prepared with topics such as (this is not an exhaustive list)

1) The FSM approach
2) The MVC pattern
3) The State, Observer, Bridge, Command, and Composite patterns
4) The drawing program
5) OO design principles

The two questions asking you to code will look somewhat like the following. They should suggest that you have to understand the design and implementation of the Microwave and Drawing Program quite well.

Question 1 (30 points)

The following state transition table was created for the following situation.

<a description of the problem>

A partial implementation is given in the Java project Exam 3 Q1. Complete the implementation, so it works correctly. You must "continue" the implementation, rather than do a complete redesign and reimplementation. The naming conventions, packages, and style must match the existing implementation.

No documentation is needed. But other coding standards (naming, readability, etc.) apply.

1) Rename the project as <Your-last-name>Exam3Q1. Make sure it is an Eclipse Java project with no modules. You **will** lose 1 or 2 points if you don't do this. So take care of it right away. Improper format and names are a problem for me to import and/or locate your project.
2) If you add methods to existing classes, put them at the end of the classes to which they belong, so they are easy to locate. There **will** be penalty for not following this requirement.

Question 2 (30 points)

In the drawing program implementation (Exam 3 Q2), add code to implement the functionality to draw <shape-name>. <Shape description>. Your implementation must not depend in any way on the shapes already supported in the system. The implementation must conform to the style and approach employed for the other shapes.

No documentation is needed. But other coding standards (naming, readability, etc.) apply.

3) Rename the project as <Your-last-name>Exam3Q2. Make sure it is an Eclipse Java project with no modules. You **will** lose 1 or 2 points if you don't do this. So take care of it right away. Improper format and names are a problem for me to import and/or locate your project.
4) If you add methods to existing classes, put them at the end of the classes to which they belong, so they are easy to locate. There **will** be penalty for not following this requirement.

The question for analyzing the a problem and create the state transition table would be like the following.

Question 3. (20 points) Analyze the following problem and use FSM modeling to arrive at the state transition table. All states and events must be clearly named. If you use improper names or numbers for the states or use unconventional ways of representing state transitions, I will not bother to interpret your answers and the credit will be 0 for this question. The table should be created using Word. Tables that are handwritten or with badly aligned entries will not be given credit.

<problem description>

Ground Rules

1. This is an open book/open notes test. You may use any resources on the internet. The only restriction is that you are not allowed to communicate in any way with anyone: like phone call, online chat, email, posing questions on online forums, etc. So, this is an individual effort.
2. You must have your video on. Mute the audio. If you need to ask me a question, please send a message privately to Zoom chat. I may move you to a waiting room and we can talk briefly.
3. If you have to leave the exam for more than a couple of minutes, please get permission from your instructor. Use the approach in (2) above.
4. Two of the questions ask you to write Java code. These must be coded as **separate Eclipse Java** projects to the dropbox for Exam 3. Ensure that any Java code you write is syntactically correct and works as specified. Name the projects <Your-last-name>Exam3Q1 and <Your-last-name>Exam3Q2.
5. Submit the answer to the state transition table as a Word file or a PDF file. Do not submit Excel spreadsheets or picture files.
6. Please follow the directions carefully, so you don't lose credit.
7. The exam must be turned in on time. I will announce the deadlines at the start of exam. If you are late, this may mean a loss of time for you to take the exam.

The first three questions will be posted in a PDF file under the Exams folder.

The multiple-choice/true-false/multi-select/short-answer questions will be posted as a quiz under Assessments...Quizzes. Note that this section is only worth 20 points, not 50, unlike the previous exams.