# CSSE 220---Object-Oriented Software Development

## Exam 2 -- Part 2, October 19, 2018

**Allowed Resources on Part 2**. Open book, open notes, and computer. Limited network access. You may use the network only to access your own files, the course Moodle and Piazza sites (but obviously do not post on Piazza) and web pages, the textbook’s site, Oracle’s Java website, and Logan Library’s online books. You may only use a search engine (like Google) to search within Oracle’s Java website - all others uses or accessing websites other than those mentioned above are not allowed.

**Instructions.** You must disable Microsoft Lync, IM, email, and other such communication programs before beginning part 2 of the exam. Any communication with anyone other than the instructor or a TA during the exam may result in a failing grade for the course.

You must actually get these problems working on your computer. Almost all of the credit for the problems will be for code that actually works. If you get every part working, comments are not required. If you do not get a method to work, comments may help me to understand enough so that you can earn (possibly a small amount of) partial credit.

Submit all modified files via Moodle.

Problem Descriptions

**Part C1: Recursion Problems (21 points)**

The class Recursion contains 4 recursion problems (JUnit test cases are also included). You only need to solve 3 of the 4 problems. For the problem you chose not to do, leave it blank and insert a comment saying that you skipped it. These problems must be solved with recursion - a working solution with loops is worth no credit. If you have time and want to do a fourth one for fun, that’s fine, but we suggest saving it until you finish the rest of the exam.

**Part C2: Polymorphism Problem (9 points)**

The given code (included in PolymorphismMain and the various LessTimid classes) implements a program that suggests modifications to sentences to make them less timid sounding. Here’s an example run:

Welcome to less timid!

Currently installed enhancers:

1. Adds '!!!!!'to the end

2. Adds 'OR ELSE'to the end

3. Adds ', stinkybutt'to the end

4. Replaces ' ' with '\_'

5. Replaces '?' with '!!!'

6. Replaces ':)' with ':-P'

7. Make string all captials

What phrase would you like to enhance?

Could I have a homework extension? :)

Less timid suggests:

COULD I HAVE A HOMEWORK EXTENSION!!! :)OR ELSE

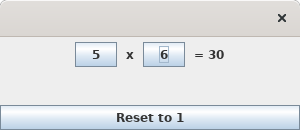
The program lists all the currently installed enhancers and then applies 3 random enhancers to the given sentence. The code works correctly but currently there is duplication in PolmorphismMain’s printDescriptions and applyRandomEnhancement methods. This duplication gets worse as we add new kinds of enhancer classes beyond the 3 in the given code. Redesign the LessTimid classes using interfaces or inheritance to solve this problem.

As you make changes you should keep the functionality of the code the same.

**Part C3: Exception Problem (5 points)**

For this part you will make changes to the file Exception.java . The TODO comment that appears just above findFile’s header has the details on what must be done. There are unit tests to help you verify if your code works.

**Part C4: GUI Problem (21 points)**



The initial code for this part is in GUIProblemMain.

**Part 1.** (7 points) Make the GUI match the picture above, EXCEPT all numbers buttons should be initialized to 1. If you cannot match the picture exactly, feel free to add buttons in any way that works. You will lose credit on this part, but it will let you work on the later parts of the question and get credit for them.

**Part 2.** (7 points) Add listeners to the 2 numerical buttons. Pressing a numerical button should increment the number on the button that is pressed. If you cannot successfully do this you can earn partial credit for printing text to the console when a button is pressed, even if the listener does not visibly update the GUI.

**Part 3.** (7 points) Make it so that when an number button is pressed, the equals label is updated to show the correct multiplication result. Also make the Reset to 1 reset both buttons to 1.