Name:_____ Section: _____ CM: _____

CSSE220—Object-Oriented Software Development: Exam 1 – Part 2, March 26, 2019

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 don't post on Piazza) and web pages, the textbook's site, Oracle's Java website, and Logan Library's online books.

Instructions. *You must disable Skype, 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. There are several different small methods to write, so you can get a lot of partial credit by getting some of them to work. If you get every part working, comments are not required. If you do not get a method to work, comments may help us to understand enough so we can give you (a small amount of) partial credit.

Begin part 2 by following the instructions provided by your instructor for cloning the exam repository.

(Ask for help immediately if you are unable to do this.)

Part 2 is included in this document. **Do not use non–approved websites like search engines (Google) or any website other than those noted above.** (Exception: you may use a search engine to search for Java documentation on Oracle's Java website. To do so, go to google.com and search for java 8 oracle *****.) Be sure to turn in these instructions, with your name written above, to your exam proctor. **You should not exit the examination room with these instructions.**

Honesty pledge.

I understand that I may not communicate in any way with anyone other than the instructor and their assistants or use any non-approved resources during the exam. I understand that after the exam, I will not communicate anything about the exam to any student that has not already taken the exam.

I understand that if I violate either of the above, that the penalty is at least a -100% on this whole exam, and that I may be expelled from Rose-Hulman.

If you understand these and agree to abide by them, then check here: _____

Otherwise, check here and talk to your professor privately soon after the exam: _____

Your name (print legibly): _____

Your signature: _____

Part 2—Computer Part — Problem Descriptions

Part A: Small Problems (20 points) Implement the code for the 2 functions in SmallProblems.java – each problem is worth 10 points. Instructions are included in the comments of each function. Unit tests are included in SmallProblemsTest.java.

Part B: Map and 2D Array Problems (20 points) Implement the code for all 3 of the functions in MapAnd2dArray.java – the 3 problems are worth 7, 6, and 7 points, respectively. Instructions are included in the comments of each function. Unit tests are included in MapAnd2DArrayTest.java.

Part C: Test This Class (7 points) Implement a unit test for the function in TestThisClass.java. You will add a file TestThisClassTest.java that will contain your test. Your test should have four assertions that test a variety of cases, but need not be exhaustive.

There may or may not be an error in the provided function, you only need to test it with four different cases.

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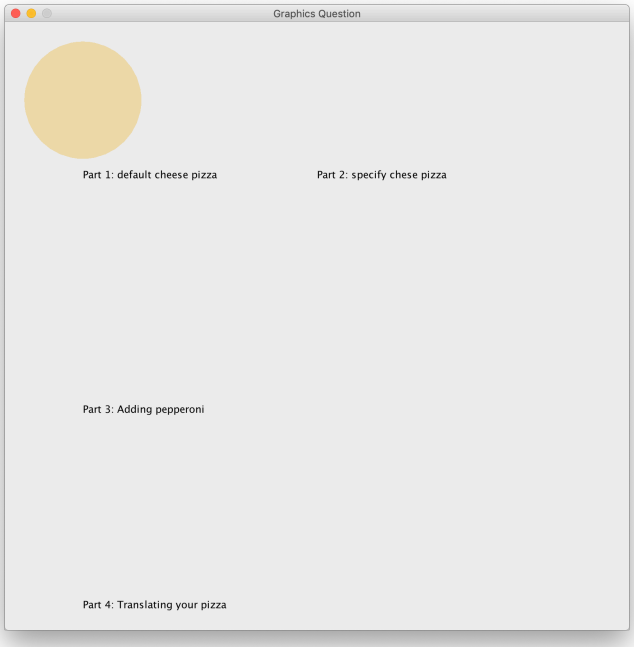

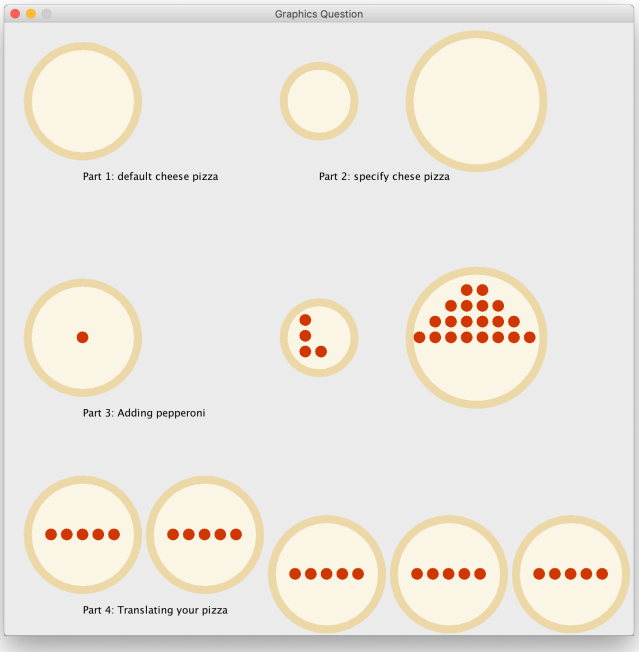

The initial display you see from running code

The final output you should produce

Part D: Pizza (18 points)

Read over all these instructions carefully. Make sure you understand completely what functionality you have to implement before you start coding. Ask questions if anything is unclear. Do all your work for this part of the exam in the pizza package.

Stage 1 (5 points)

When constructed with no parameters and the crust and cheese are drawn, a cheese Pizza should fill a circle with color CHEESE_COLOR, centered at (`100, 100`) and a radius of 65 (`"radius of crust" - CRUST_THICKNESS`) pixels. See the figure to the RIGHT above to see what the output for Part 1 should look like.

Stage 2 (5 points)

Uncomment the code in `PizzaComponent.java` and add a new constructor that takes 3 parameters. The first two parameters should be the x and y coordinates of the Pizza's center. The third parameter should be a `size of the Pizza`, which is the diameter of the Pizza.

Stage 3 (6 points)

Uncomment the code in `PizzaComponent.java` and implement the method `addPepperoni` to `Pizza`, which takes 3 parameters. The first two parameters should be the x and y coordinates of the TOP LEFT corner of the pepperoni slice and the third parameter is the graphics context that will be used to draw the pepperoni. The pepperoni size and color are given in the `Pizza` class. Care must be taken to remember the locations of the pepperoni slices. That will become useful for stage 4.

Be sure your picture matches the given one on the RIGHT (excluding Stage 4).

Stage 4 (2 points) <u>DO NOT TRY PHASE 4 BEFORE COMPLETING THE REST OF THE EXAM</u>

Uncomment the code in `PizzaComponent.java` and add the missing functionality to be able to translate a Pizza. After setting up the translation parameters, modify the `drawOn` method so that translated Pizza's are displayed.

Be sure your picture matches the final output given on the RIGHT above.