CSE 621: Fundamentals of Software Engineering
Project Phase 4 – Final Demonstration
Final Exam Slot: May 12, 2020 10:15am – 12:15pm

Description

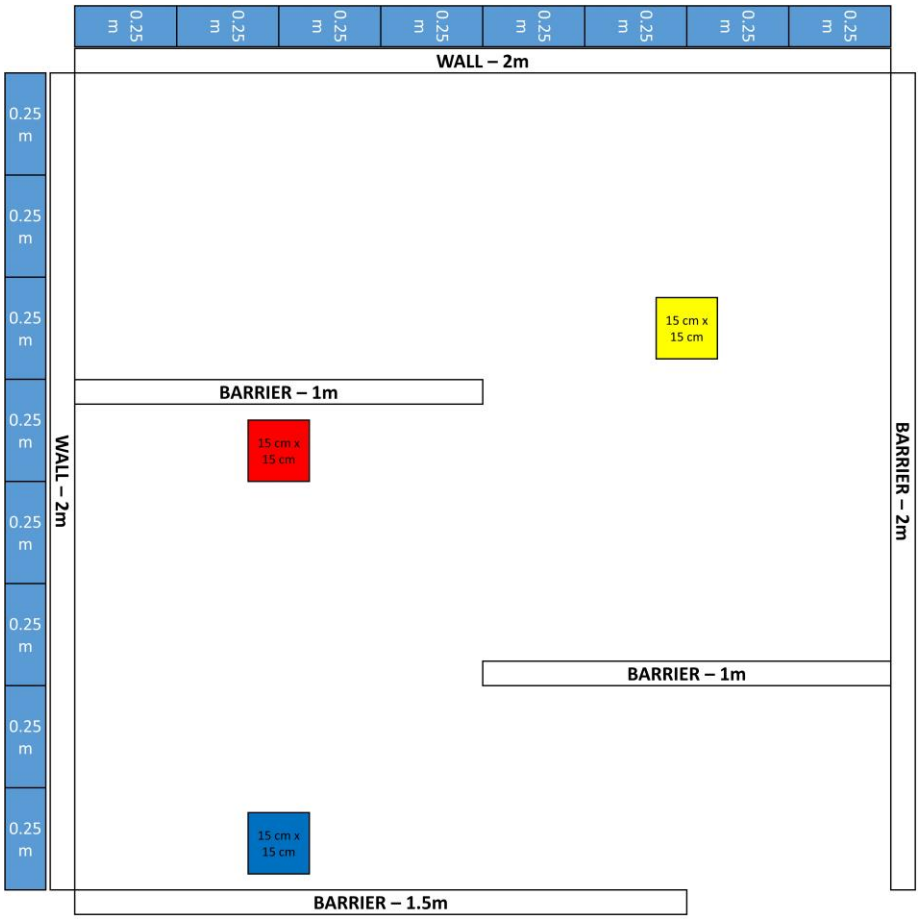
For the final demonstration, you will demonstrate your code generator's ability to generate code for any given statechart, as well as your robot's ability to execute the generated code. For the final demo, there will be 3 parts:

1. Setup and Fine Tuning
2. Code Generation
3. Functional Demos

The Setup Step will need to be completed prior to the final exam slot to ensure your environment, code generator, and robot are ready to conduct the required tasks for the final demo.

Step 1: Setup and Fine Tuning

The first part of this will be setting up a course for the robot to navigate. You will need to setup something as close as possible to the diagram below:



Notes:

- The inside space will be 2m x 2m.
- I suggest using the corner of a room so that two walls are fixed.
- You will need to use barriers that are tall enough for your distance sensor to detect.
- The thickness of the barriers is not overly important, but I do not recommend anything more than 10cm thick.
- The paper squares should be placed approx. 5-10 cm away from the wall. The most important aspect of their placement is that if a robot is instructed to stop 10 cm from a wall, then rotate and continue moving, it should be able to drive over a square along that wall. This is true of the yellow square as well, its distance would be "above" the middle barrier.

In addition to setting up your course you will need to make sure your code generator and robot are equipped to handle the provided inputs and the course. This may mean making some minor adjustments to your code generator or robot configuration. The following points are important:

- Distances will be in metric units, specifically meters. (distance < 0.2 means less than 20cm)
- The colored papers should be recognizable by your robot as red, blue, and yellow; you may want to ensure your robot "sees" them as these colors.
- Your robot should be able to detect objects as close as 10cm, and as far as 30cm away; and should be able to safely reach these distances (meaning the distance should be from the front of the robot, not the sensor if it is mounted further back).
- The precision of your rotation of 90 degrees is important; I have mentioned this to you previously if it seemed like an issue. Be sure that your robot rotations are exact on the course surface. Turn radius is important too as it will possibly need to be able to rotate in corners.

You may want to try your robot out on some possible paths through the course. I will not provide any examples, but you can likely guess at some potential state and transition configurations. You should be able to approach walls/barriers then turn to ride along them. You should be able to stop on selected colors, you should be able to stop specific distances away from obstacles. Think along these lines for your prep.

Step 2: Code Generation (May 12, 2020 – 10:15am)

Join the WebEx meeting for the class (https://miamioh.webex.com/meet/rapose) with the ability to show video of your course. This may be using a phone, or laptop camera pointed at the course.

When your exam begins, you will be provided THREE (3) statecharts in mdj format that conform to the specifications given to you for Phase 2 of the project. You should run each of them through your code generator and produce the resulting LeJOS code. You will have a small window of time to troubleshoot if necessary. **You should NOT open these statecharts** in StarUML; only run them through your code generator.

Step 3: Functional Demos (May 12, 2020 – approx. 10:30am)

One statechart at a time, and one team at a time, you will show your robot completing the course based on the statecharts provided. Since you will not know what the robot is supposed to do; sit back and hope for the best! I will let you know how they do. If catastrophic errors occur, you will be able to troubleshoot and be given another chance.

Final Submission

You will submit via Canvas:

- A Photo of your completed obstacle course
- Final Code Generator Code
- 3 x Generated LeJOS files from the Exam

Combine the above into a single PDF for submission. Ensure your code is well documented (should be done before the exam), and the document is well formatted. You can prepare the document ahead of time, and incorporate the 3 x generated code during the exam time.

Rubric

There will be a total of **50 points** available, broken down as follows:

Category	High Quality	Medium Quality	Low Quality	No Points
Appropriate Course was Constructed	The course was designed to specifications and a photo documenting this was included. **5 Points**	The course had minor errors in design that has some small impact on the function of the robot to complete the tasks. These errors were resolved and the robot was able to complete its tasks. **4 Points**		No course was constructed, or the course was not correct. **0 Points**
Final Code Generator Code	The final code submitted corrected for earlier issues identified through MBT, instructor feedback, etc. and is a robust fully functional system. It also conforms to style guidelines for the appropriate language. **15 Points**	The final code submitted contains some small issues with respect to the generalizability of the code it can generate leading to small errors in generation. Alternatively, the code is not well documented. **12 Points**	There are significant errors in the final submitted code generator that cause it to generate largely incorrect code, or it is incapable of generalizing inputs, working only on a subset of the input meta-model. **9 Points**	No final code generator was submitted. **0 Points**
3 x Generated LeJOS Files	Three files were correctly generated and submitted. **18 Points**	There were issues generating one of the files **12 Points**	There were issues generating 2 of the files. **6 Points**	None of the files generated. **0 Points**
Completion of Tasks	The robot successfully completed all three tasks without issue. **9 Points**	The robot had issues with one of the tasks but completed others. **6 Points**	The robot was only able to successfully complete one of the required tasks. **3 Points**	The robot did not complete any tasks. **0 Points**
Professional Document	The submitted document contains all required aspects, is well formatted and presented, and is professional. **3 Points**	There were minor errors present in the submitted document in terms of including all details or professionalism of the submission. Professionalism includes title pages, section headers, and other common document aspects. **2 Points**		The submitted document did not contain all information or was unprofessional. **0 Points**