Software Engineering Assignment – Part 3

Deadline: Wednesday 17th May 2017

1. Overview

Now that you have an initial prototype of your game up and running, your customer is requesting a number of improvements. The learning objective for this part of the assignment is the application of appropriate design patterns in response to certain problems.

2. Required Improvements

Your customer requires the following improvements:

2.1 Different Map Types

The customer wants you to add support for different map types in the game. At the start of the game, the user will be asked to select between 2 maps: (1) Safe or (2) Hazardous. A safe map is will have a maximum of 10% water tiles whilst a hazardous map will have between 25% and 35% water tiles. In future, more map types will be made available so the design of the system should cater for this.

2.2 Store one map in memory

The customer would like to eventually make the game playable online between hundreds of users. However she is afraid that maintaining a large number of concurrent maps will prove expensive. Implement a solution whereby only one instance of the map is stored yet each user is only allowed to see the parts which they've explored.

2.3 Team Exploration

The users can decide to play in collaborative mode. In this mode, the user is asked to how many teams are required and players are subsequently randomly assigned to a team. Whenever a member of a team explores a new tile, all other members of the team can see that new tile. There are no bounds on the number of teams so the system needs to handle this elegantly.

3. Deliverables

You are to implement each of the above enhancements using a specific design pattern of your choosing. Continue to use a test driven approach and maintain the highest code coverage you can.

When you are done with this part of the assignment, please do the following:

1. Tag your source code on Github so that we can refer to it in its current state in future.
2. Please take note of your code coverage metrics at this point and take note of (1) which parts of your code are not covered and (2) why they are not covered. This will form part of your final assignment report.
3. Provide a report with the following information:
    a. Code coverage analysis for parts 2 and 3
        i. Provide coverage metrics
        ii. Explain which parts of the code you did not cover and why
        iii. Please note that an Emma plugin is available for Eclipse which will provide inline coverage data. This provides you with more information than the Emma plugin in Jenkins.
    b. Design details for the basic version of the came. Do not go overboard with this. Just provide me with a class diagram and any other information which you deem to be of interest.
    c. For each enhancement:
        i. Explain your choice of design pattern
        ii. Explain how you implemented it (class diagrams and/or code snippets)
    d. At least one screenshot for the basic version of the game and each enhancement.
    e. Instructions for configuring and running the game
4. Submit the assignment in hard-copy to the departmental secretary (Kevin Cortis) by the deadline along with a CD/USB containing the source code

4. Questions and Clarifications

Any questions and clarifications should first be looked up on the Assignment forum in the VLE. If you do not find your answer there, you should post the question on the forum. It will be answered by fellow students or the lecturer. If you feel your problem has not been solved within 2 days of posting it, e-mail the lecturer personally.
