Software Engineering Methods Q1 2016

Instructor: Dr. Alberto Bacchelli Assignment 03

Teaching Assistants: Liam Clark, Robin van Heukelum, Bart de Jonge, Jean de Leeuw, Thomas Overklift, Mark van de Ruit, Wouter Smit, Martijn Steenbergen, Gijs Weterings Week 06

In this assignment you apply (1) **Design Patterns**. To correctly complete this assignment you **must**:

- Carry out the assignment with your team only–unless otherwise stated. You are free to discuss solutions with other teams, but each team should come up its own personal solution. A strict plagiarism policy is going to be applied on all the artifacts submitted for evaluation.
- Complete the assignment by following the SCRUM methodology. Regarding this, you must push the following documents on the main branch of your GitHub repository by the specified deadlines and tag the commit that your TA has to consider for grading:
  - A sprint backlog for this assignment, using the template "Sprint backlog - template" available on Blackboard, by **Oct 10, 2016 @ 10:45AM**.
  - A sprint retrospective for this assignment, using the template "Sprint retrospective - template" available on Blackboard, by **Oct 14, 2016 @ 17:55PM**.
- Provide solutions to the exercises. Each solution will consist of changes to the source code of your project and/or explanations (*e.g.*, of decisions taken):
  - The explanations must be written in a PDF file with the name: *Group[id on google spreadsheet]-[AssignmentNumber].pdf*[1]
  - Changes and explanations must be pushed to the master branch of your GitHub repository by **Oct 14, 2016 @ 17:55**[2] and the commit that you TA has to consider must be tagged.

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[1] *e.g.*, a correct name would be: *Group0-03.pdf*.

[2] Solutions sent within the first 24 hours after the deadline will be given 50% of the points they would normally get. Solutions sent after 24 hours from the deadline will not be graded.

Exercise 1 - Design patterns (30 pts)

Choose **two** design patterns among those that we saw in class[3] and that you did not use in a previous assignment. For **each** chosen design pattern, you must have a corresponding implementation in your code. If not, refactor your code to include it. Then, per each chosen design pattern, complete the following points:

1. Write a natural language description of *why* and how the pattern is implemented in your code (**5 pts**).
2. Make a class diagram of how the pattern is structured statically in your code (**5 pts**).
3. Make a sequence diagram of how the pattern works dynamically in your code (**5 pts**).

Exercise 2 - Your wish is my command (30 pts)

1. Each project and group is heading to a specific direction and there are specific things that should be implemented and improved. Who knows it better than your TA?

   In this exercise, you have to talk to your TA (during the group meeting on Monday) and (s)he will give you what to do next to your game.[4]

   After you receive the task from your TA, write a requirements document, which will be evaluated in the same way as for the requirements document of the initial version. Afterwards you must implement the requirements. (**22 pts**).

2. During the analysis and design phases of this extension use responsibility driven design and UML (push to the repository the *single* PDF file including all the documents produced) (**8 pts**).

Exercise 3 - 20-Time (30 pts)

1. Google asks its employees to spend 20% of their time at Google to a project that their job description does not cover. As a result of the 20% Project at Google, we now have Gmail, AdSense, and Google News, among the others.

   This is your occasion to have similar freedom. You can decide what to do next to your game:[5] It can be an extension/improvement from any perspective, such as improved code quality, or novel features.

   Define your own requirements and get them approved by your teaching assistant. Afterwards you must implement the requirements. (**22 pts**).

2. During the analysis and design phases of this extension use responsibility driven design and UML (push to the repository the *single* PDF file including all the documents produced) (**8 pts**).

[3] *i.e.*, strategy, observer, decorator, singleton, adapter, iterator, composite
[4] The TA will take into account that this exercise is worth one-third of this assignment
[5] Consider that this exercise is worth one-third of the non-optional points of this assignment, so plan its load accordingly.