

Assignment 3

Exercise 1

Task

Choose two design patterns among those that we cover in class until the lecture on Nov 23 (included), excluding the pattern you already implemented in Assignment 2 (e.g., Singleton). For each chosen design pattern, you must have a corresponding implementation in your code. If not, refactor your code to include it. Then, complete the following points:

Design Pattern 1

Task 1

Write a natural language description of why and how the pattern is implemented in your code.

Description of why and how the pattern is implemented

Task 2

Make a sequence diagram of how the pattern works dynamically in your code

Sequence diagram

Task 3

Make a class diagram of how the pattern is structured statically in your code

Class diagram

Design Pattern 2

Task 1

Write a natural language description of why and how the pattern is implemented in your code.

Description of why and how the pattern is implemented

Task 2

Make a sequence diagram of how the pattern works dynamically in your code

Sequence diagram

Task 3

Make a class diagram of how the pattern is structured statically in your code

Class diagram

Exercise 2

Consider ten important classes in your checkers game.

Task 1

Describe why these classes are important in your system's design and what their current responsibilities are (you must use UML diagrams to support your description)

UML Diagram

Description of the 10 most important classes and their responsibilities

Task 2

Since these are important classes, you want to make sure that they are well tested! Write unit tests to reach at least 80% line coverage in each of them. If this goal is not achievable (or not important), you can explain why.

Task 3

Create a testing report for your system with: (1) line coverage overall and (2) a histogram with the distribution of the line coverage.

Overall line coverage report

Histogram of the line coverage distribution

Exercise 3

Task 1

Google (used to?) ask their employees to spend 20% of their time at Google on a project that their job description does not cover. As a result of the 20% Project, Google now has services such as Gmail and AdSense. 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 tutor (especially in terms of load). Afterwards you must implement the requirements.

Description of the requirements

Task 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 produced documents)

Responsibility Driven Design

CRC Cards

UML