Reflection for Assignment Three

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***Abstract*—This reflection will mainly reflect on the learning for assignment three as well as the design and implementation for this assignment. It will focus on multiple sections such as Introduction, Evaluation and Differences and Configurations. Introduction will talk about what the author has learned in the assignment. Evaluation will talk about the good design of the assignment and its limitation. It will also provide helpful resources such as lectures. Finally, the reflection states differences between initial and final designs, and two configurable values in this project.**

Keywords—reflection, game, java, bulls and cows

I. Introduction

This assignment requires the author to finish the cows and bulls game project. By finishing this assignment, I have learned three things: Firstly, I've learned how to create a project from zero. For example, designing an UML diagram will help us have an initial structure of the whole project. Secondly, debugging is a long but important process. Revising again and again so that you can make your project better. For instance, finishing the hard AI part is one of the most difficult parts in this project. I've tried multiple ways to solve it. At first, I have intended to create a file filled with numbers and use Collections to make this file generate numbers. However, it's too complicated. Then the debugging process have helped me find out an easier way to solve this problem without creating a file for hard AI, which is to use Collections and "getRandomString()" method to generate number in a list and modify it. Thirdly, the project organization plays an important role in the assignment. As this is a big project which requires many classes working together, it is better to clarify and understand the role of each class plays in the project. For example, in my project, "GameManager" class will mainly be responsible for managing the whole process of the game, and "GameLibrary" class will mainly be used for reading from a file and saving to a file. Therefore, creating a project, debugging process, and organizing the project structure are three main things I've learned in this assignment.

II. Evaluation

The assignment went quite well as it has achieved functions and requirements for the project. It has finished functions, such as the algorithms of "EasyAI", "MediumAI", and "HardAI", the processes of printing to the console, getting the secret code from the user, reading from a file, and saving result. It also manages invalid input well by asking the user to input again. In addition, it has two required configurable value in "GameManager" class.

A. Good Design and Limitations

In my opinion, the inspiring part of my design is the function design of "GameManager" class and "GameLibrary" class. With regard to "GameManager" class, its main function is to control the whole process of the bulls and cows game, it gets all user inputs and passes the commands to other classes, such as "GameLibrary". The main function of "GameLibrary" is to read and save files. "GameLibrary" will read from a file called "random.txt" when the user chooses automatic mode and write the correct file name ("random.txt"), and will save to a file when the user chooses to save the result of the game. As a result, their functions are quite clear and professional. Furthermore, "getRandomString()" method in "Gamer" class has also been used effectively in this project. For instance, it has been used in all AI classes, as they all need to generate random number for guessing. In this case, they could simply use this method in different ways.

However, there are also limitations in this project. As "GameManager" controls the whole process of the game, methods in "GameManager" class seem to be too many, which is not clear to see. As a result, I have added some comment lines for each part, making it easier to understand.

B. Helpful Resources

For this assignment, assessment 2, which is the Farm game, and lectures of Exception Handling, IO, and Collections have helped me a lot. Assessment 2 has helped me construct a prototype of this project structure. For example, the thought of creating "GameManager" class is from the "FarmManager" class in Assessment 2. In terms of lectures, as I need to use exceptions, IO, collections in this project. I have referred to these lectures to understand how to use them in an appropriate way.

III. Differences and configurations

A. Changes betweeen Initial design and Final implementation

My final implementation is quite different to the initial design. I have effectively taken the advice from the feedback. For the first feedback, the lecturer has told me the function of "Game" class is not very clear, and there are many repetitive methods in all AI classes. As a result, instead of letting "GameManager" class handling everything, I have changed the Game class into "GameLibrary" class, to mainly read and save files, which makes its function more concrete and professional. I also have deleted unnecessary methods in AI classes and moved some important method implementations into "Gamer" class such as "getRandomString()" method. For the second feedback, the lecturer told me to set up the default configurable values, reformat the code, handle exceptions and add some comment lines. Accordingly, I have set up two configurable values in "GameManager" class, reformatted the code, handled the invalid input from the user and added comment lines. Moreover, I have also removed the "AIFunction" interface as the Gamer class has achieved the same function for the project.

B. Configurations

- MAX_TURNS: The maximum allowed number of turns before the game ends in a draw (default is seven).
- MAX_LENGTH: The length of a secret code.