

Computer Science And Engineering University of Dhaka

Project Report: Software Design Pattern Lab(CSE-3201) Fall – 2017

Project name : Tank Shooter (Game)

Submitted by: Md. Faruk Hossain
Roll: 84
Md. Mizanur Rahman
Roll: 60
Dewan Tariq Hasan
Roll:10

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Introduction:

Gaming in the field of software engineering is the fast growing field of software engineering and development. The development of gaming is even more rapidly growing sector where the future is more prospective. We are working with this game as our software design pattern lab-3201 which is a 1.5 credit course. This report discusses the game overview, including the description and game play, and then focuses on the game design, describing how the game is implemented and the programming functions and libraries used in the design.

Motivation:

We were excited from the very beginning of our course about what we will implement in our software. Our primary concern was what would be best for our career and what type of project would be best for implementing design patterns. Consequently it turns out that the best choice is to make a game for this software project. Game is the best way of enjoying leisure time. Moreover all type of people like to play games since the outgrowth of digital industry has provide available sophisticated devices. Our Game is also built around an exciting concept which is thrilling to play. The enormous growth of the game industry in bangladesh as well as the whole world is also an inspiration for our project plan.

Objectives:

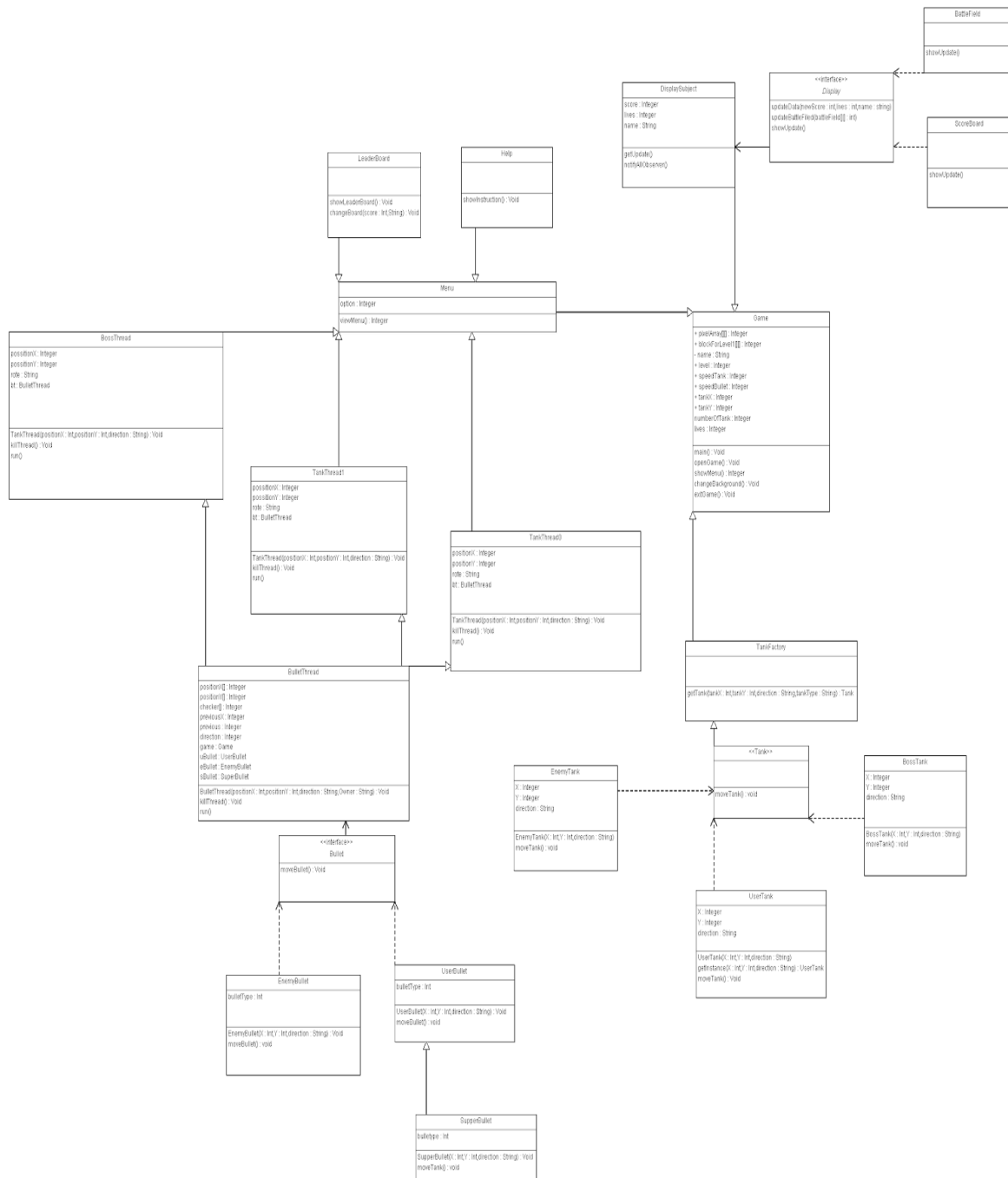
Our prime objective is to implement a software project for Software Design Lab-3201. But according to our course our first priority is to implement a object Oriented Design for the project which will implement multiple software design pattern as far taught in our class. Other than this our goal is to make the game more user

friendly and exciting to play. We also focus on the graphics of the game which will make the project more good looking.

List of Objectives:

1. Software design patterns:
 - a) Strategy pattern
 - b) Observer pattern
 - c) Factory pattern
 - d) Singleton pattern
 - e) Decorator pattern
 - f) Command Pattern
2. Make the Game more user friendly for the user.
3. Ensuring the reliability and usability of the software.
4. Ensuring the maximum efficiency of the features of the software.
5. Maintaining the portability of the software at highest level.

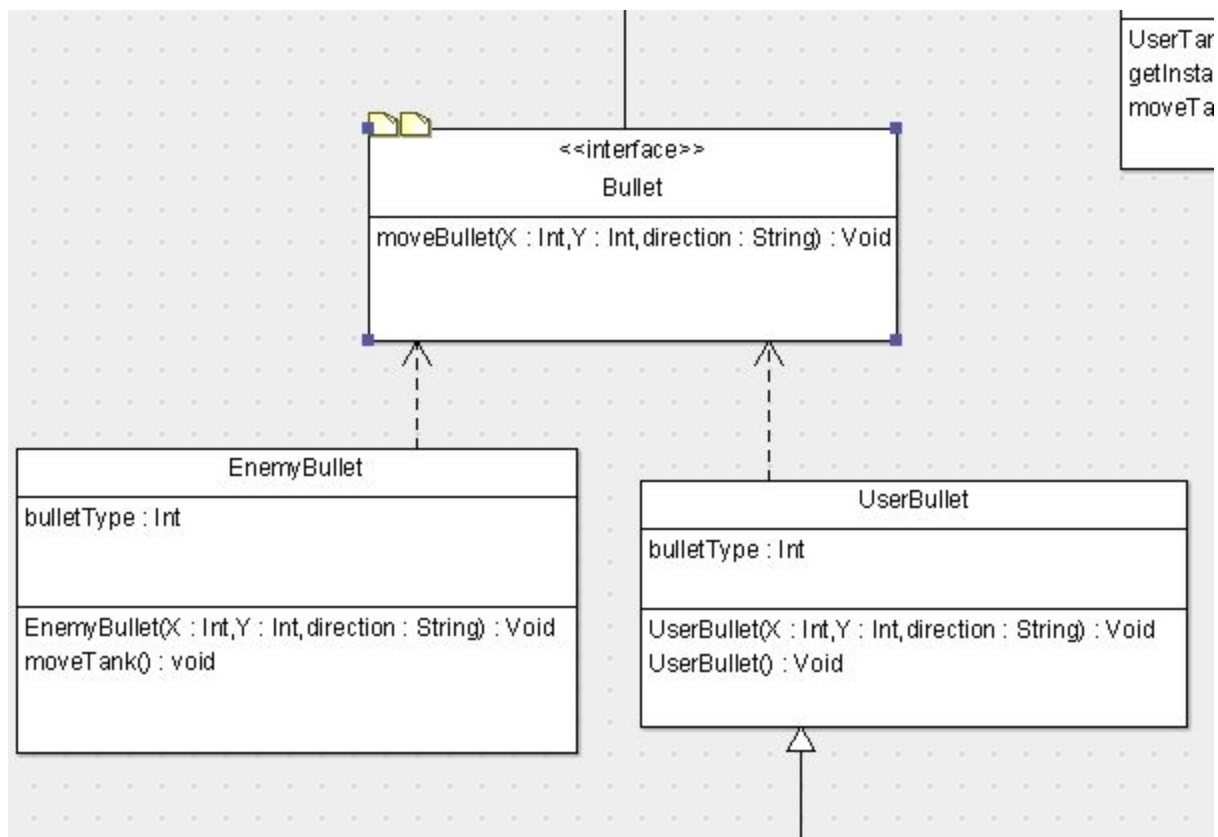
Class Diagram:



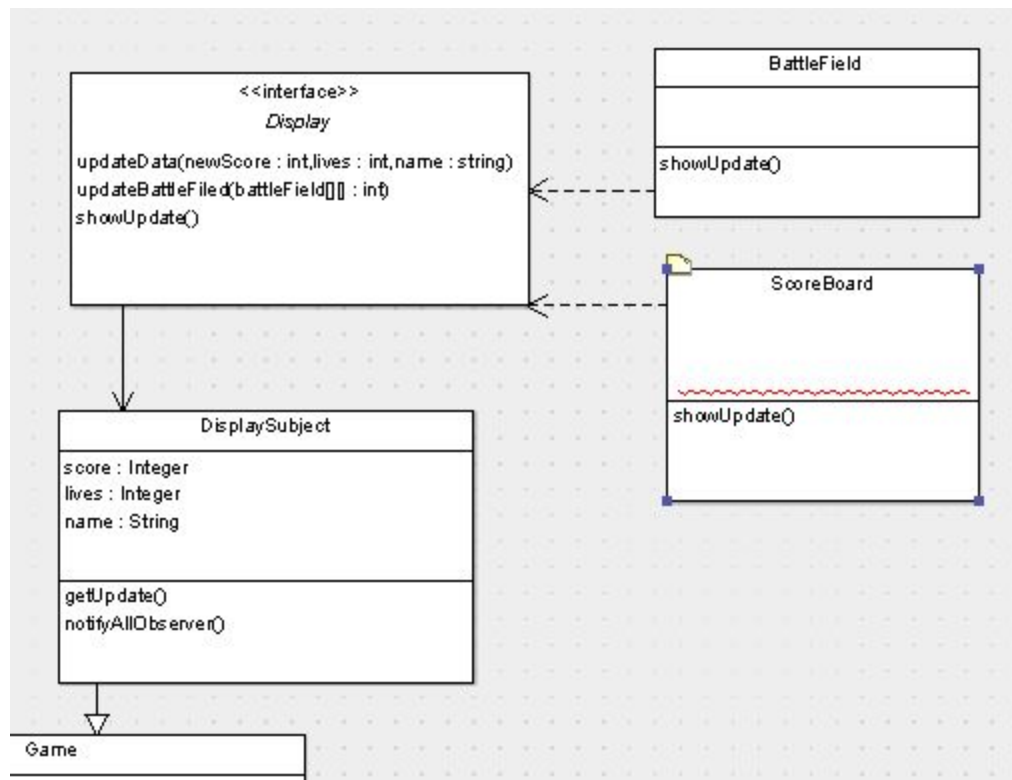
Patterns Implemented:

Since the project is based on software design pattern we tried to implement highest possible number of patterns in our object oriented design. The patterns which have been used in this project are :

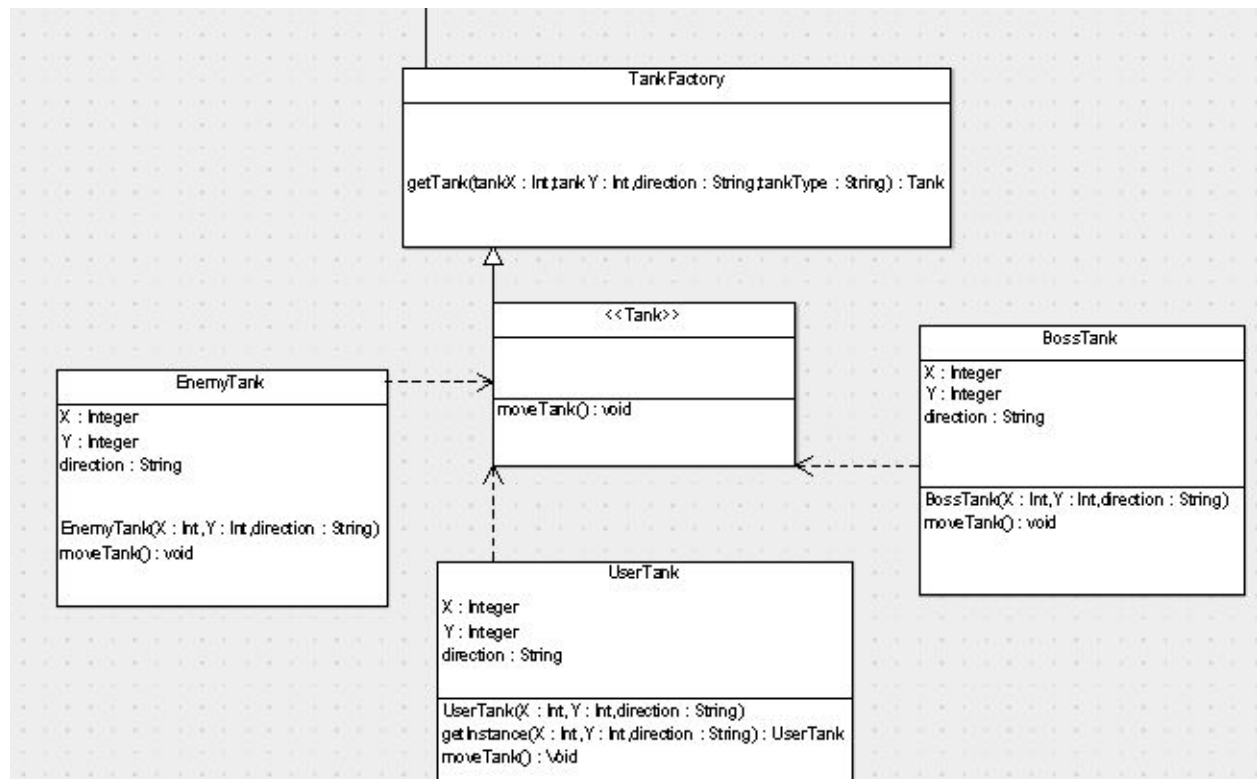
Strategy Pattern:



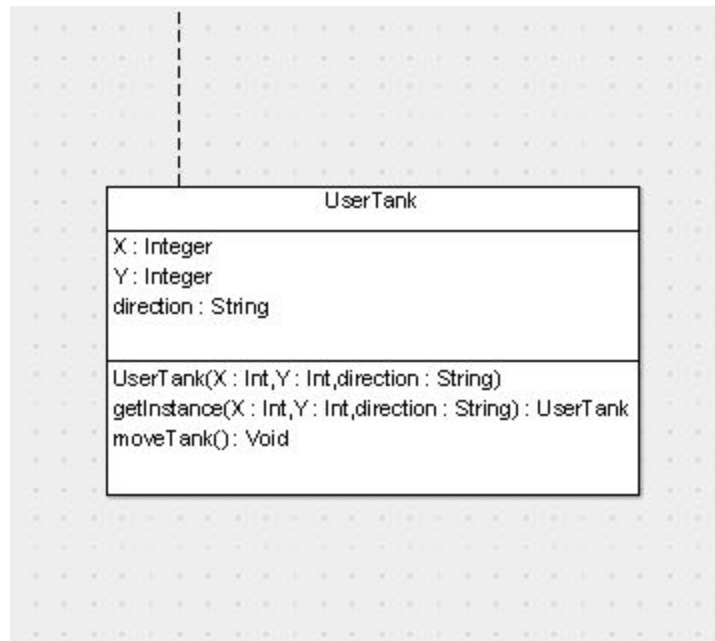
Observer Pattern:



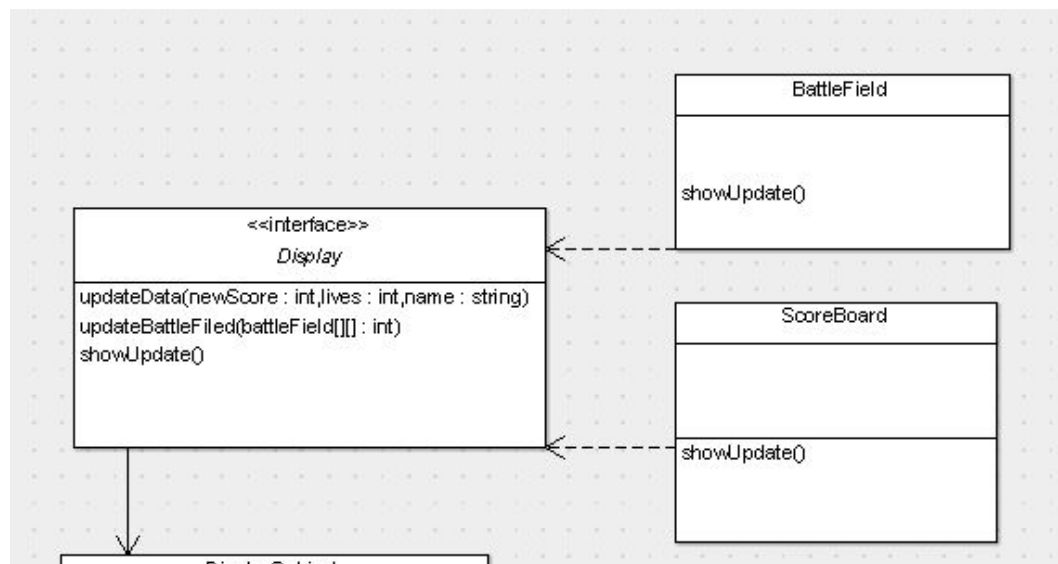
Factory Pattern :



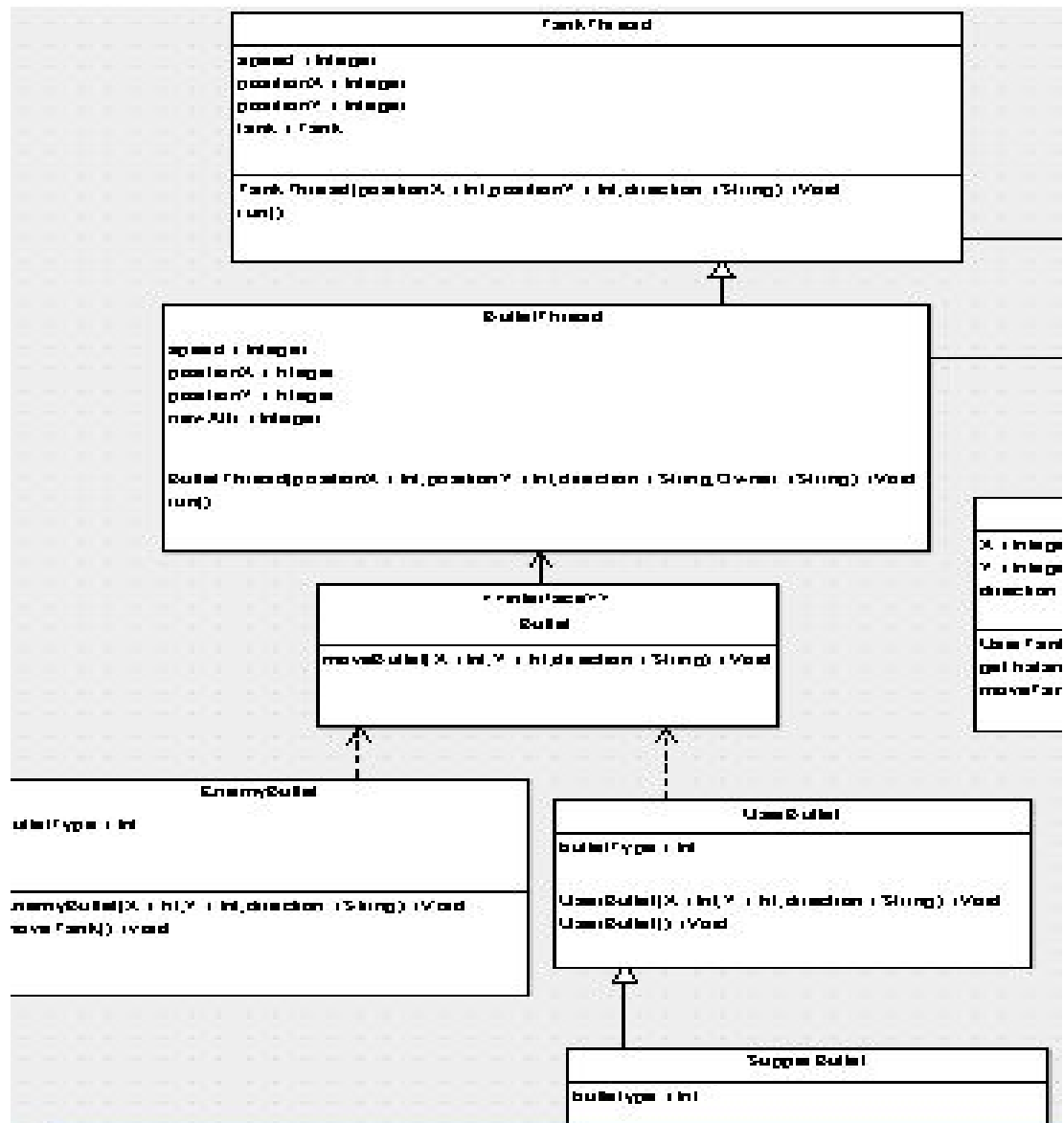
Singleton Pattern:



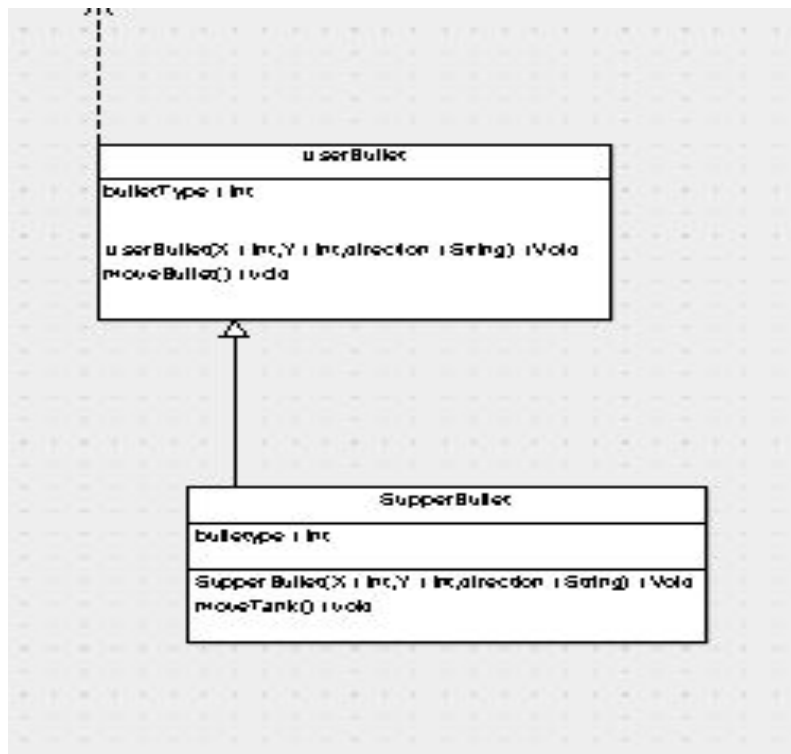
Template pattern :



Command Pattern:



Decorator Pattern:



Project Features:

Tank Shooter is a strategy game inspired by thrilling shooting games . We tried to make the features more user friendly which will make the game exciting as well as enjoyable:

Map:

After start up of the game the map will be visible to the user which is comprised of lots of obstacles like enemy tank , forest ,fort and wall. The Map will be updated when one mission is completed. More exciting and hard maps will be loaded after each successful mission completed .

Enemy tank:

The villains will always give hard time to the hero because of its powerful weapon and strategic attack .Updated enemy tank will mesmerize the user which will excite the hero to play more and eventually having fun.

Hero tank:

The hero tank is the user who will eradicate the obstacles like enemy tanks and other random objects. After successful mission hero tank will gain more power which will help to destroy the enemies.

Mission:

The user will have missions according to the maps provided. Without successful mission next level will not be unlocked .

Scoreboard:

According to the performance of the User the scoreboard will be updated which is visible in the game interface. There will be also information about the mission.

Leaderboard:

As per the scoreboard the leaderboard will be updated which will honour the best scoring performers of all time of the game.

Team Member Responsibilities and Contribution:

1. Dewan Tariq Hasan (10)

In design:

1. Singleton Design Pattern.
2. Decorator Design Pattern.

In coding:

1. User tank movement.
2. Menu showing.
3. Scoreboard showing.
4. Displaying the battleground

2. Md. Faruk Hossain (84)

In design:

1. Factory Design Pattern.
2. Command Design Pattern.
3. Observer Design Pattern.

In coding:

1. Enemy tanks movement.
2. Bullets movement.
3. Scoring.
4. Leader board changing and showing.

3. Md. Mizanur Rahman (60)

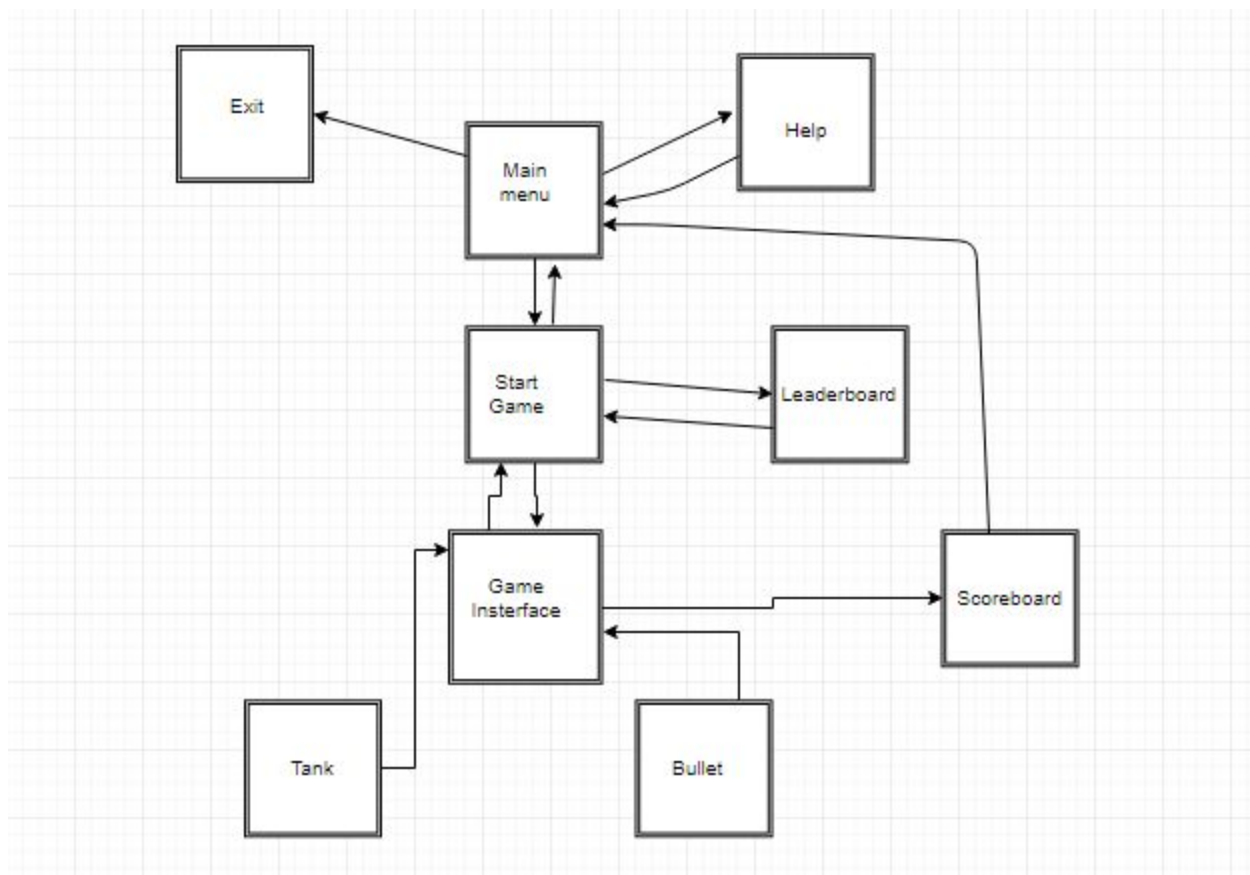
In design:

1. Strategy Design Pattern

In coding:

1. Showing instruction.
2. Make designs of bullets.
3. Set the positions of bullets on battleground.

System Architecture:



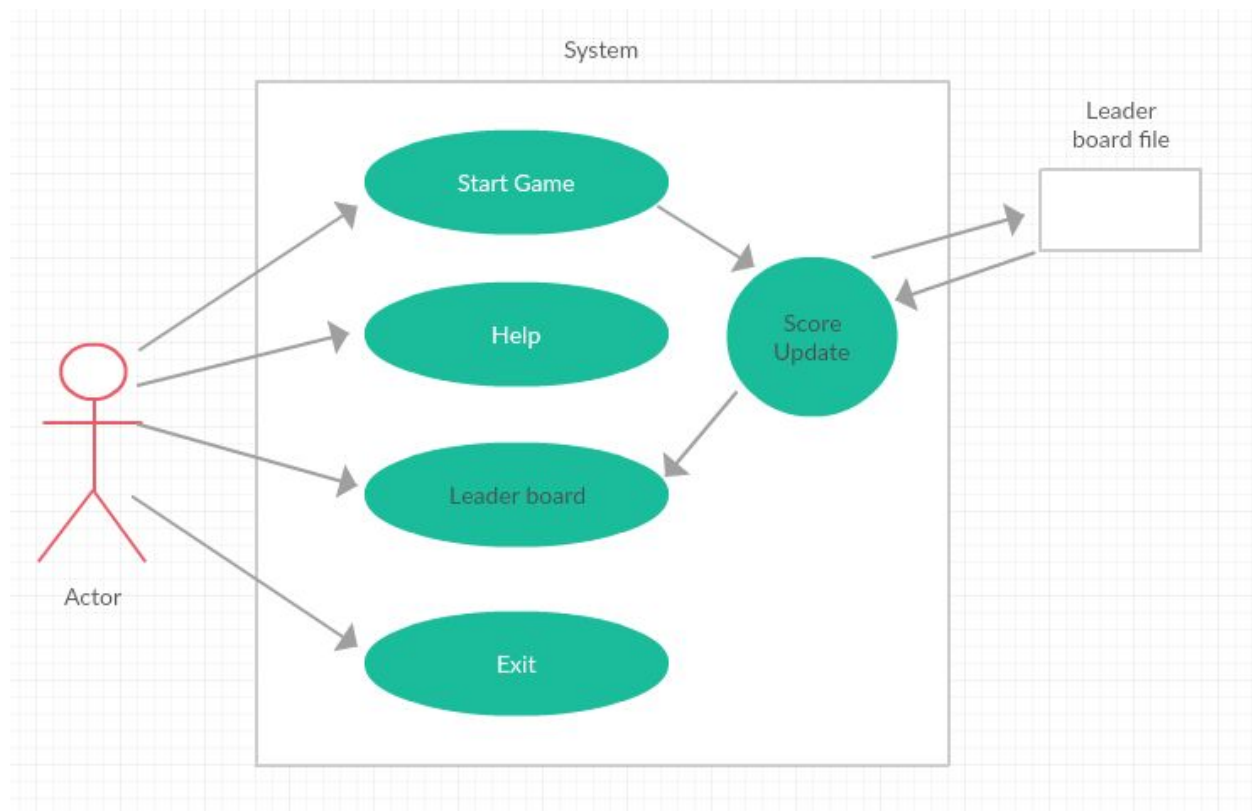
Platform, Library & Tools :

This is a cross platform software project which is runnable when there is java runtime environment. Then if there is GCC or compiler the project is ready to run. Java swing library has been used for the design of the graphics.

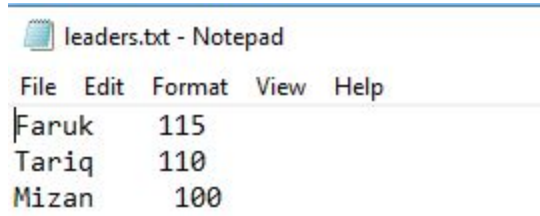
Limitations:

1. Due to the use of shared memory of the game interface we are facing 1 bug which were unable to be debugged.
2. Template pattern was not implemented in our project though it was on our object oriented design .Because we had to extends JPanel to complete drawing of Battle fiend.

Use Cases:



Database:

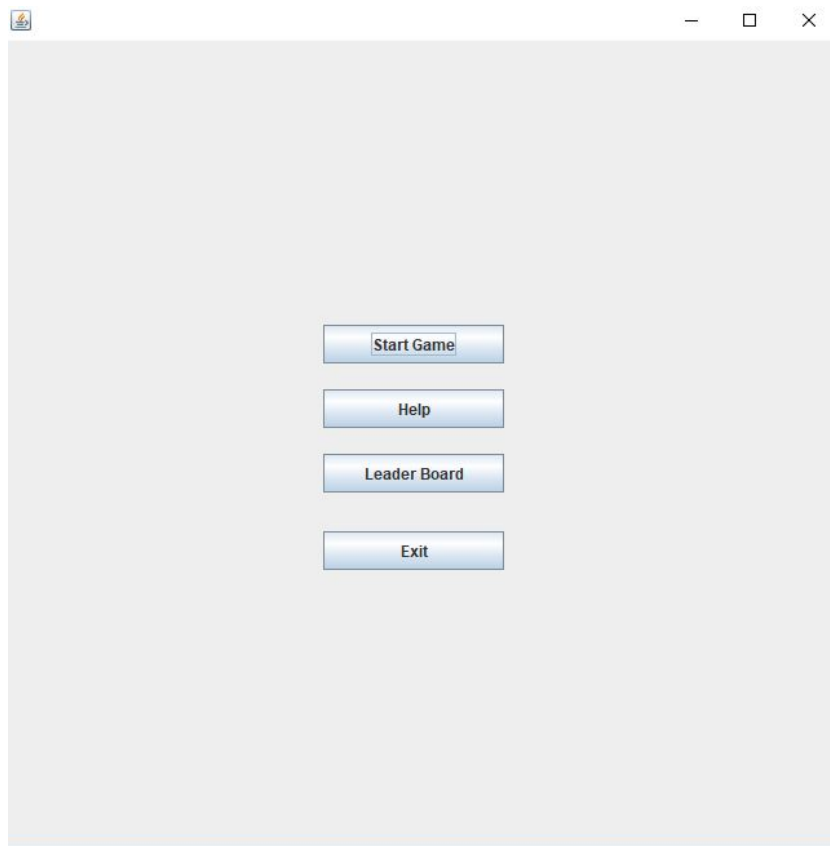


A screenshot of a Notepad window titled "leaders.txt - Notepad". The window contains a list of names and their corresponding scores, separated by a tab character. The names are Faruk, Tariq, and Mizan, with scores of 115, 110, and 100 respectively.

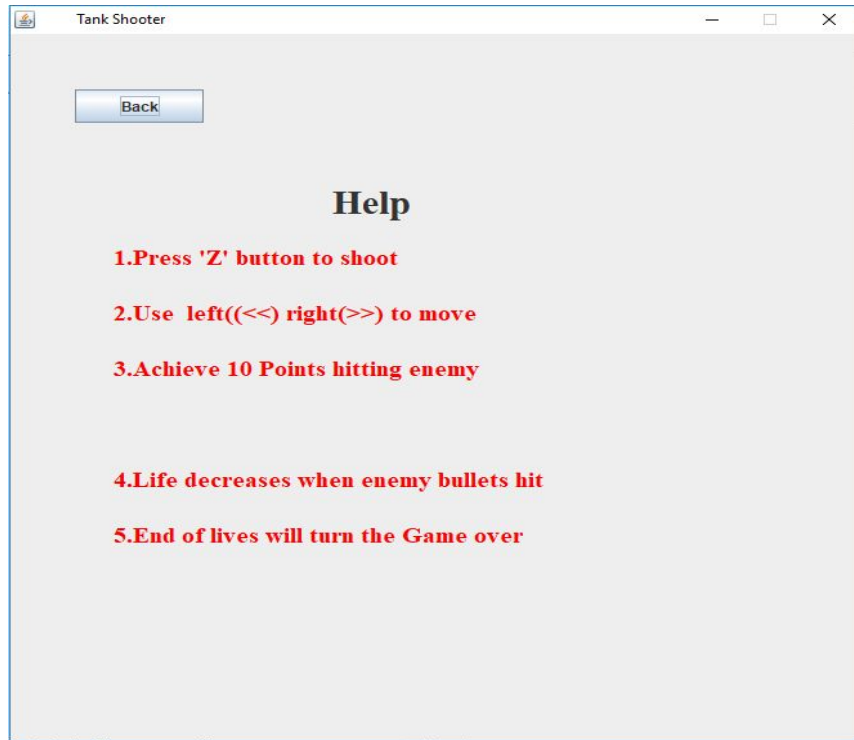
File	Edit	Format	View	Help
Faruk	115			
Tariq	110			
Mizan	100			

Screenshots:

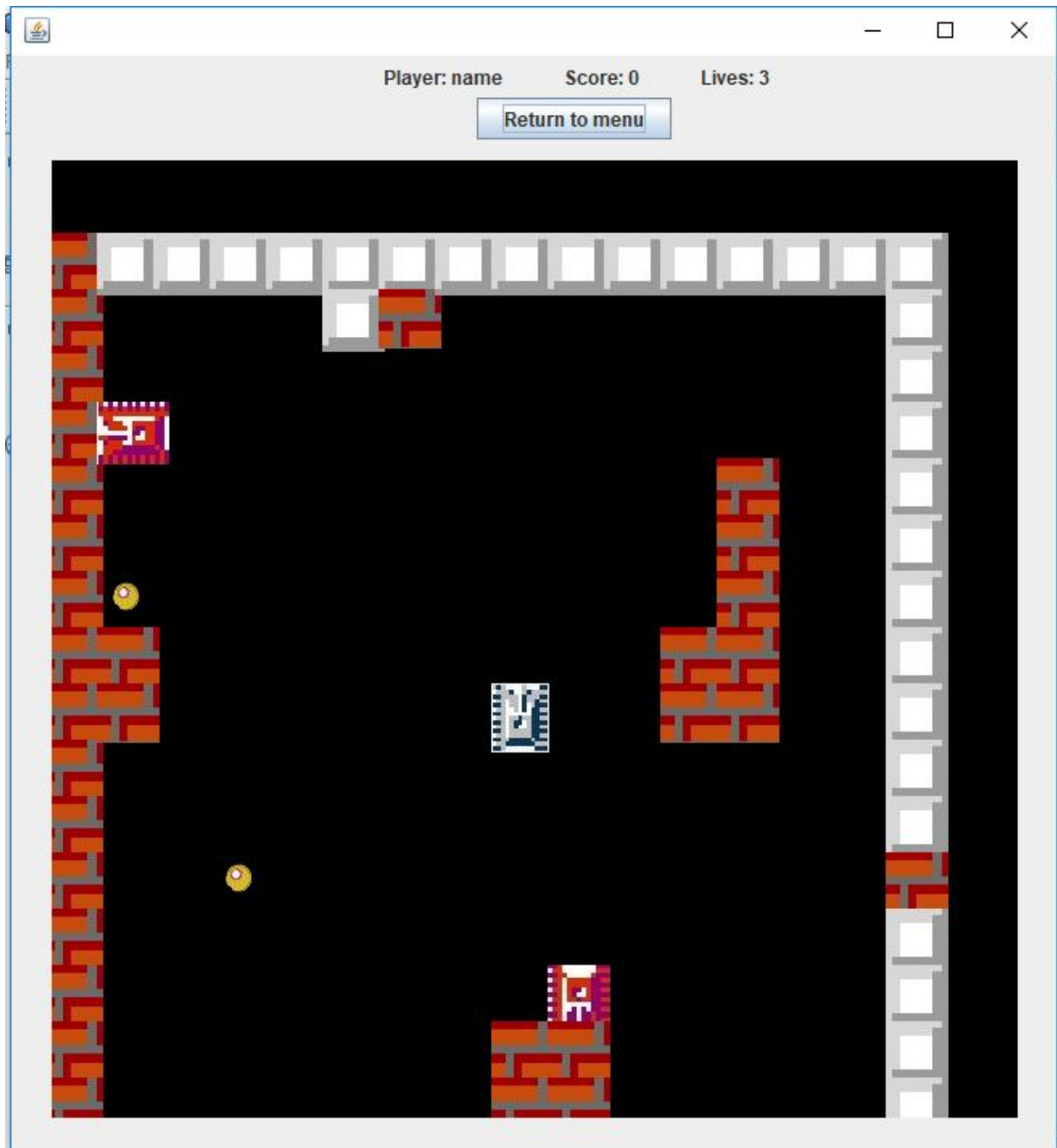
Menu:



Help:



BattleField:



Leader Board:



Conclusions:

It was very exciting to design patterns and implement a project with its design. To complete this project we have to learn some design patterns which are mostly used in game industry. Moreover we have learned how to maintain some threads. After the project we have a clear concept of the meaning of Object Oriented Programming.

Future plan:

1. One of our key feature was to implement a boss tank which will be unlocked after successful mission. But we could not complete due to the lack of time. But it will be implemented soon.

2. Our plan was to make multiple levels which we is now one of our future plan for this game.

References :

- 1.Stack overflow : <https://stackoverflow.com/>
- 2.Tutorials Point : <https://www.tutorialspoint.com/>
- 3.Google : <https://www.google.com/>