CS 319 - Object-Oriented Software Engineering
Engineering
Final Report

Defenders Of The Kingdom
Group 3-H
Alp Ege Baştürk

Barış Eymür

Emre Gürçay

Öykü Ece Ayaz

Table Of Contents

1. Changes in the Implementation

Most notable change in the implementation is the merging of MapController and GameMap. Merge is not completed yet, however operations which was predicted to be done by the MapController were distributed to other classes. Collision detection is detected by the moving objects. Map information is provided by the GameMap class. Information about the tiles, such as the ones used for collision detection, are provided by the Tile class. Also GamePanel Class is added to the project. This class is used to show objects related to core game. There were various changes in the methods and attributes of classes. Additional attributes like, counters, flags location tracking values were added to various classes for game logic. Drawing methods were added to game objects and caller classes. Interfaces Runnable, JFrame and JPanel were used. Also map store format changed to .mat from .txt, which is a minor name change only. Furthermore, TowerListController was implemented as a Panel. This class was handling the panel that shows the tower list on the right of the Game Frame.

2. Status of the Project

Completed Parts and Bugs

A game map is generated. Attackers and towers can be added to the map. Attackers follow a path in order to reach to the gates of the kingdom, which is currently empty and when they reach game ends. Indexing errors were possible but solved with try-catch blocks.

The main menu, the pause menu and credits have been implemented. Leveling is not completed yet, the first level is implemented with a simple test map generated by Octave and modified manually. Menu and the Game Map are integrated, user can click on Play Game button at the bottom to start the game. However level selection is not functional yet. Clicking on the only enabled button, "Button 1" would cause an exception, thus we handled it. However button becomes black after click.

We planned to implement 3 types of attackers and 2 types of towers. Currently we have implemented an attacker class. Tower class is not functional. Attacker class has motion and collision detection abilities. It checks the tiles around it by getting information from the GameMap class and moves accordingly. However there is a bug in the motion. Object can detect collisions correctly and change direction accordingly but they cannot adjust themselves in the y-axis. Thus, after changing direction in y-axis, they move out of the path. This does not change the result or collision detection however it ends up with attackers moving on a *shifted path*.

We have implemented loading images for the objects. Each object has an image which is loaded.

Game is tested on Linux, Mac and Windows environments with success. It is known that changing workspace and returning in Mac results in color change in the menu.

Parts Need to Be Done

These parts are noted in the code as TODOs in more details. Most notable missing part is the towers and attack methods. Towers are not functional and attack logic is not

implemented yet. Furthermore, Input manager is not functional. It's functionality is currently provided by the classes which need file system access. For example GameMap reads the array by itself. Images are also read by the classes.

Input controller is not functional completely. We are able to detect mouse operation however inputs are not used in the game logic.

Help page is implemented however help text is not written yet, thus it shows a text stating this.

3. User's Guide

3.1 Requirements and Installation

Defenders of the Kingdom is a tower defense game implemented in Java, hence the in order to run the game the computer must have installed Java Run Environment (JRE).

The project is implemented using IntelliJ IDEA as the IDE. We have tried to generate a .jar file. We managed to do the generation by using command line and IDE tools, however images and graphics are not loaded properly if game is started from the jar. We predict that it is the result of the method of access to the filesystem. Thus an IDE like IntelliJ is required to run the game. Project file is on the GitHub page in the master branch, test1. Project folder is *CS-319_Group-3H/test1/.*

3.2 Overview of the Game

When the user runs the game, the main menu will be displayed. The levels will be displayed for the user to select. When the user clicks on Play, the user will be directed to the game, in which there is a map, attackers, towers. The user may learn about the instructions and the gameplay by navigating to Help menu.
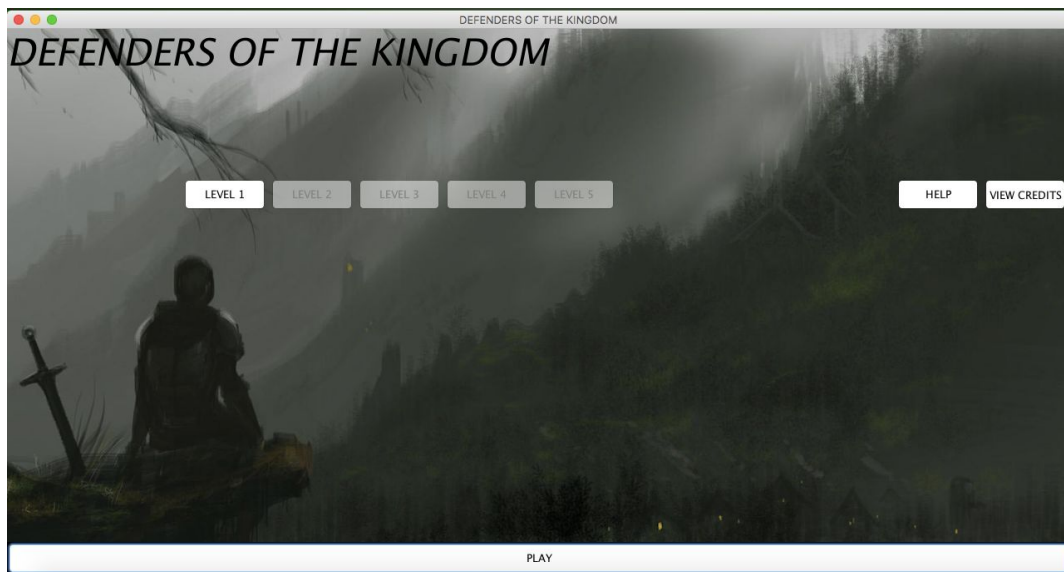
3.2.1 Controls

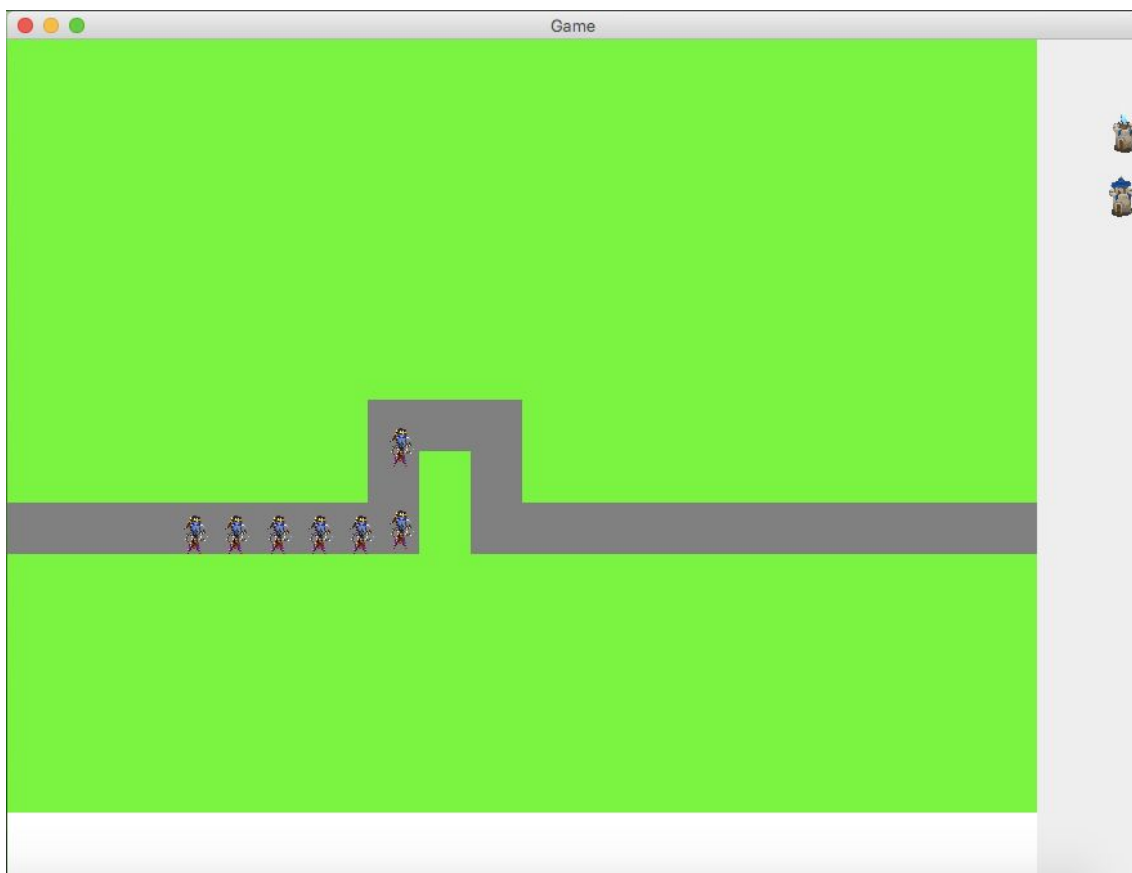The mouse will be used to interact with the towers.

3.2.2 Game Screens and Menus

Main Menu

When the player runs the game, the below screen will be displayed. Only the First button is enabled as mentioned before. Player will continue by clicking the "Play" button at the bottom of the page.
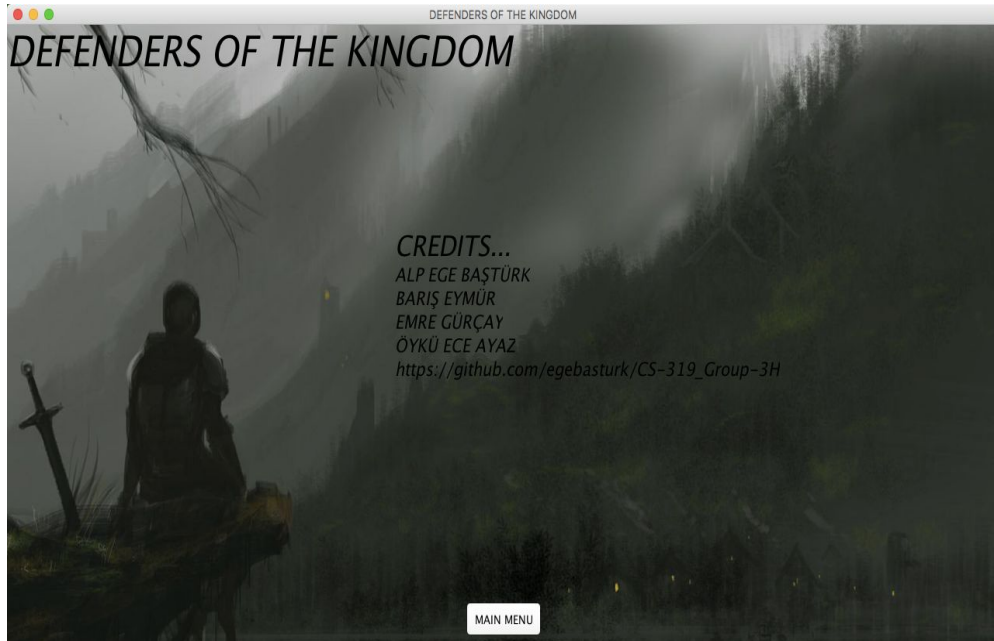
Play the Game

      Game map is shown above. Attackers seen on the path can move. Path and green fields are made from Tile objects with the information read from the matrix file. The small

towers seen on the right of the Frame is the list of towers which can be bought by the player. It is a separate panel.

View Credits

Credits page in which the developers of the game and the GitHub link is presented is below.

View Help

Help page aims to help the user in the gameplay. This page is still under work.