

# **CS319 Term Project**

## **Final Report**

1H-RISK



### **Team Members**

Kaan Atakan Aray

Rüzgar Ayan

Emre Derman

Kamil Kaan Erkan

Cankat Anday Kadim

Umut Ada Yürüten

### **Instructor**

Eray Tüzün

### **Teaching Assistant(s)**

Emre Sülün

Fall 2020

## Table of Contents

1. Introduction .....	3
2. Lessons Learnt .....	4
3. User's Guide .....	4
3.1. Main Menu .....	4
3.2. Learn to Conquer .....	5
3.3 New Game .....	6
3.3.1 Choose Map .....	6
3.3.2 Pregame Menu .....	6
3.3.3 Reinforcement Phase .....	7
3.3.4. Attack Phase .....	9
3.3.5. Fortify Phase .....	11
3.3. Load Game .....	12
4. Build Instructions .....	13
5. Work Allocation .....	14

# 1. Introduction

Immediately after improving the design of the project, the implementation stage was begun. The current implementation runs the core mechanics of the game correctly. Furthermore, the implementation features background music as well as a highly user-friendly and strong UI, whomst screenshots can be seen in Section 3. There were several promised features in the early stages of requirement analysis: improved alliance mechanism, factions for the players, AI player, and the Bilkent as a playable map. Among these features, only the alliance mechanism is missing. Therefore, the promised features could be seen as a success.

Currently our game support the following functionalities:

- Basic File operations, a user can save a game during a game and later on they can load this save file in the main menu with the load button. Also the save location can be altered from the options menu.
- Basic main menu, with some buttons to transition to different screens.
- A map choose screen, a user can choose one of the two maps from the map menu.
- A map file that specifies the necessary information for a risk game, these are: continent number, region number, continent id, number of regions in a continent, continent bonus, continent name, region id, regionButton x coordinate, regionButton y coordinate, region name. An algorithm that parses the file above and initializes the game accordingly. By using this strategy we implemented our maps easily. This strategy also allows us to add any map as much as we want.
- A game start menu that offers the user a variety of options that they can choose before starting a risk game.
- A game screen with necessary UI to allow users to play a risk game.
- An AI with difficulty options which can be chosen from the game start menu.
- Different functions that give user some additional bonuses during the game.
- Two game mods, world domination and secret mission, which can be chosen by the user in the game start menu.

- A timer
- Game sound, music and effect, which can be adjusted from the options menu.

## 2. Lessons Learnt

During the implementation of the project, we saw that the IDE is more important than it seems. The developers must wisely choose the IDE that and the SDK version of the language. Since each version has different features. Additionally, the github usage is crucial; since during our time in the implementation stage, we had some troubles with github. We enhanced our SourceTree skills thanks to the term project. Furthermore, the technology can frequently be inconsistent so being patient has a crucial role in the development. Nevertheless, the most important lesson was teamwork and communication that allowed us to complete this project.

## 3. User's Guide

### 3.1. Main Menu



**Figure 1:** Main Menu

After the user opens the game, the user is presented with the main menu. Here, the user has several options. The user can click on the **New Game** button to start a new game, on the **Load**

**Game** button to continue the previous game session, on the **Options** button to change the game settings, on the **Learn to Conquer** button to learn how to play the game or on the **Exit** button to quit the game.

## 3.2. Learn to Conquer



**Figure 2:** Learn to Conquer Page

After the user clicks on the **Learn to Conquer** button, the user is presented with a set of images. These images teach the game rules and guide the user on his journey.



## 3.3 New Game

### 3.3.1 Choose Map

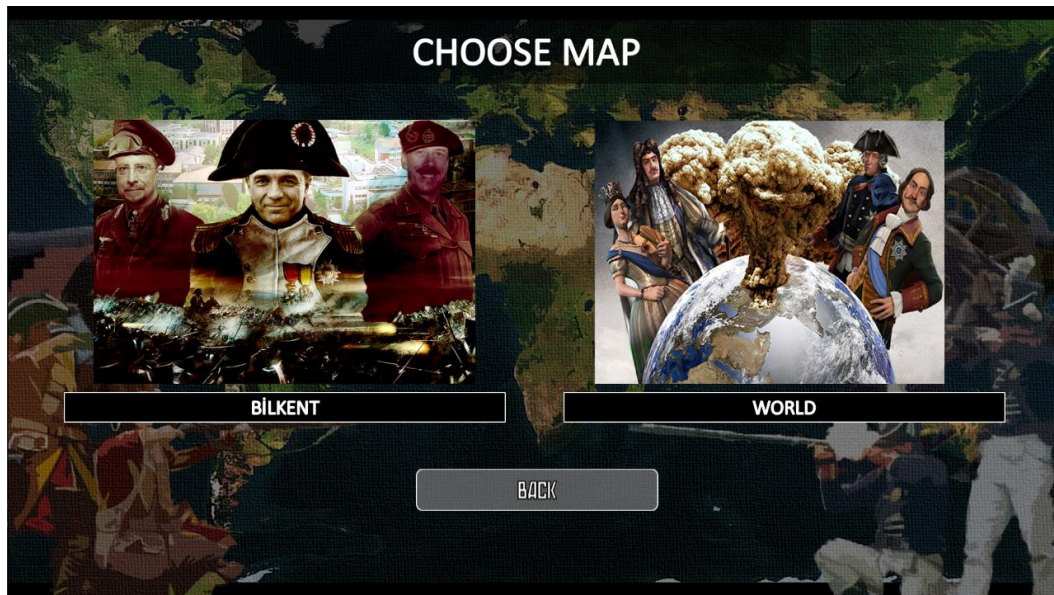


Figure 3: Map selection screen

The user can click on the **New Game** game button. After this, the player is presented with the map selection screen.

### 3.3.2 Pregame Menu

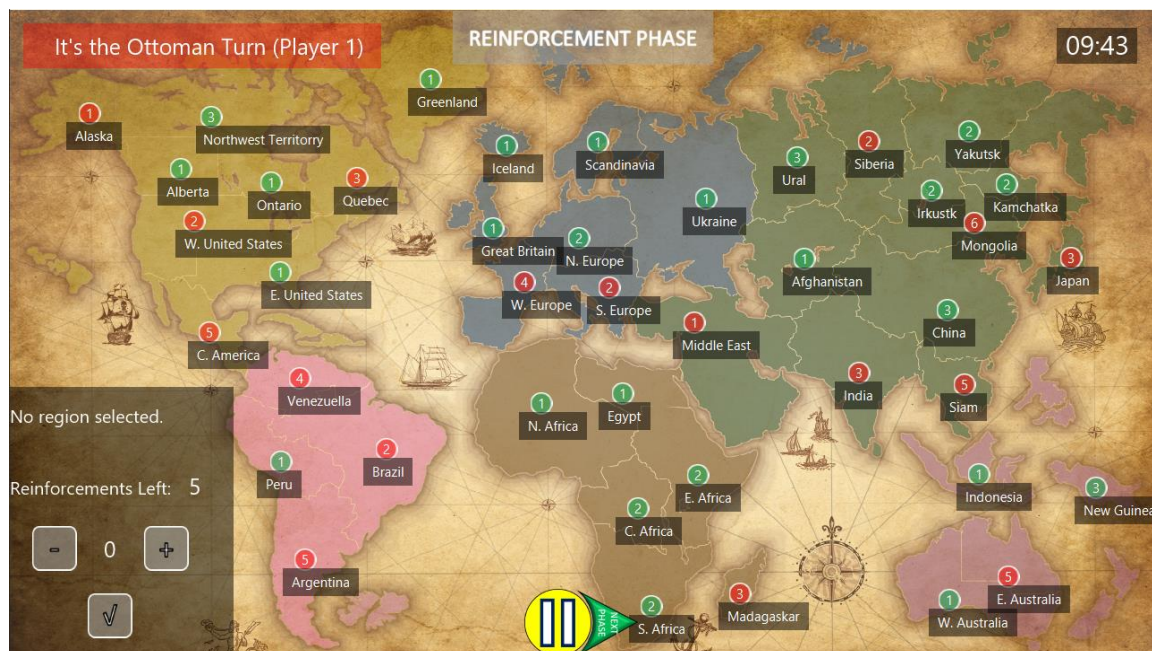


Figure 4: Pregame Menu

After the map selection, the player is taken to the pregame menu where the player can add/remove players, select the game mode and change the AI difficulty. The game mode consists of World Domination and Secret Mission modes. In the World Domination mode, players try to become the first player to eliminate their enemies and conquer their territories. In the Secret Mission mode, the player tries to accomplish the secret mission he has been assigned to.

The game consists of 3 phases: Reinforcement, Attack and Fortify.

### 3.3.3 Reinforcement Phase



**Figure 5: Reinforcement Phase**

After the pregame menu, the player starts the game.

The game map consists of 6 continents divided into 42 territories. Each continent is a different color and contains from 4 to 12 territories. Each player has a unique color as shown on the top left corner of the screen and colored circles on territories indicate which player currently occupies that territory. Numbers inside the circles indicate the number of troops that are currently on that territory.

At the beginning of every turn, including the first, players get additional troops because of the territories they occupy. This number can be found by *the number of territories occupied/3*. Players receive at least 3 troops on a turn, even if they occupy fewer than 9 territories.

If it is not the first turn, players may also get additional troops because of the continents they occupy. Below are the additional troop numbers players get for controlling all territories in that continent.

North America - 5 troops

South America - 2 troops

Europe - 5 troops

Africa - 3 troops

Asia - 7 troops

Australia - 2 troops

In the Reinforcement Stage, the player selects a territory he occupies and decides on the number of reinforcements he will place using + and - buttons on the bottom left corner of the screen. After deciding on the number, the player places these reinforcements using ✓ button. The player can repeat this process as long as he has unplaced reinforcements.

After the Reinforcement Phase, the player can move to the Attack Phase.



### 3.3.4. Attack Phase



Figure 6: Attack Phase

In the Attack phase, first the player chooses a territory to attack from. This territory should belong to that player. Then, the player chooses a territory to attack to. This territory must be adjacent to the selected territory.

After selecting the territories, the player decides on the number of troops he will attack with. If the player has more than 3 troops on his selected territory, the player can choose at most 3 troops. However, if the player has 3 or less troops, then the player can choose at most one less than the number of troops he has. The number of troops the player attacks with determines the number of dice the player rolls during the attack. Having more troops increases the player's chances.

After deciding on the number of troops to attack with, the player clicks on ✓ button to launch the attack.



**Figure 7:** Confirming the attack

If the player made a mistake, the player can click on **DENY** and go back or the player can click on **ACCEPT** and continue the attack. If the player clicks on **ACCEPT**, the player is taken to the dice roll screen.



**Figure 8:** Dice roll



After the dice are rolled, the highest rolled dice are compared. If the player's is higher, then the player's opponent loses one troop. If the opponent's is higher, then the player loses one troop. If the player defeats the last standing troop of his opponent, the player occupies that territory. The player can use the slider to determine the number of troops to move to the opponent's territory once the opponent loses all his troops on his territory. The player can continue to attack as long as he has more than 1 troop in his territory. After the Attack Phase, the player can move to Fortify Phase.

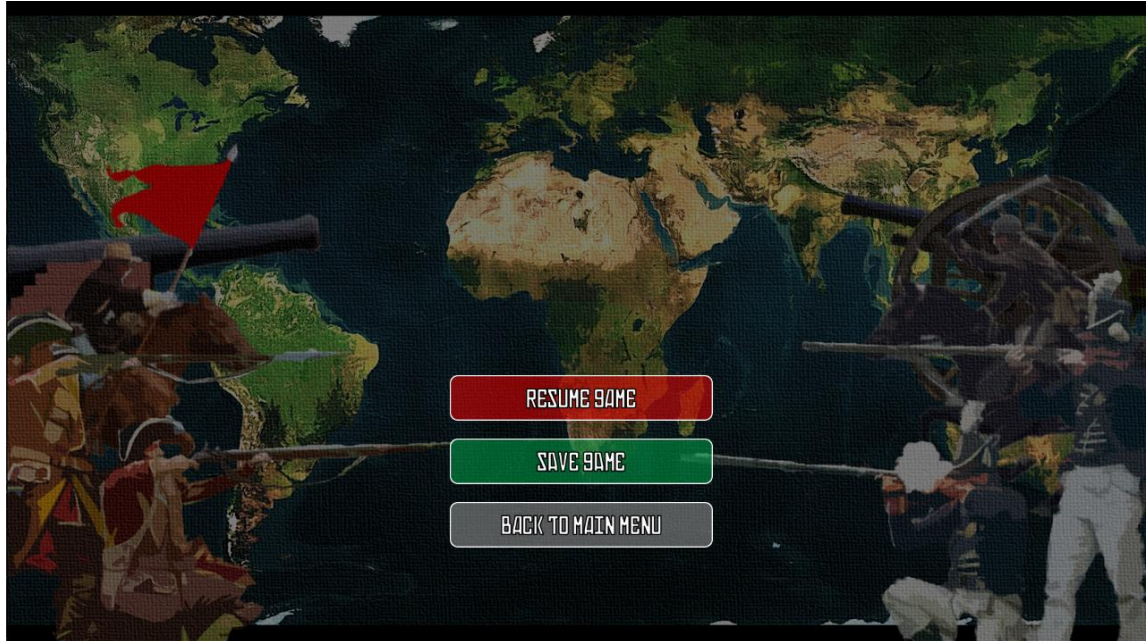
### 3.3.5. Fortify Phase



**Figure 9: Fortify phase**

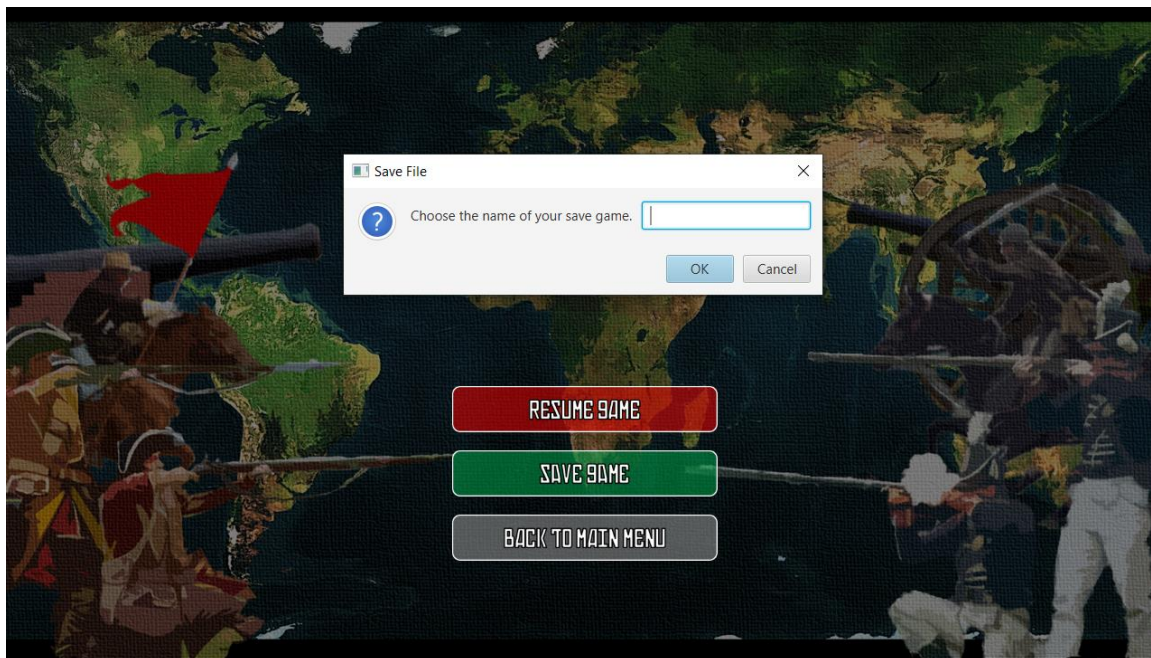
In the Fortify phase, the player moves as many troops as he'd like from one (and only one) of his territories into one (and only one) of his adjacent territories. In moving the armies from one territory to another, the player must leave at least one army behind. This process can be done only once unlike Reinforcement and Attack phase. After the player clicks on ✓ button, it is the next player's turn. Game continues until one of the players eliminates every opponent by capturing all 42 territories on the map.

### 3.3. Load Game



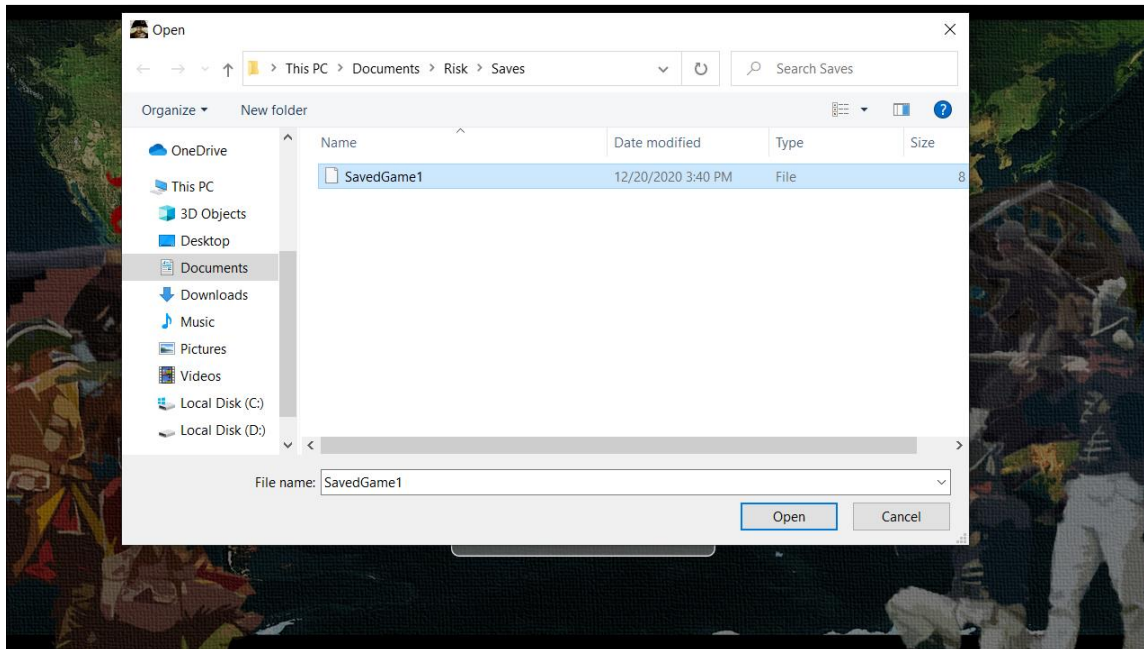
**Figure 10:** Pause menu

In the game, the player can click on the **PAUSE** button and go to the pause menu. Using the **Save Game**, the player can save the game.



**Figure 11:** Save game





**Figure 12: Load game**

Later, the player can go to the main menu and click on the **Load Game** button. After this, the player selects one of the saved games to continue that game session.

## 4. Build Instructions

### System Requirements

The standard java Runtime Environment (JRE) must be installed before installing the game. (<https://www.java.com/tr/download/>) The JDK must be the **version 1.8** to run the game without error or complication.

(<https://www.oracle.com/java/technologies/javase/javase-jdk8-downloads.html>)

### Recommended System Requirements:

- Windows 10
- 512 MB RAM or higher
- Screen Resolution 1024x768 or higher
- 90 MB disk space



**Installation How-To:**

- Download the version of the JDK 1.8 and combine with the project structure.
- Enter the project link to see the documentation of the open-source project via github.

<https://github.com/ScavBob/1H-RISK>

**IDE:**

- Clone the project via command line or bash or download the projects as a ZIP file and run it in any java compiler
- If it is not done by the IDE from the project structure mark the resources folder as Resources Root and src folder as Sources Root.
- After compilation, the project is ready to run the game.
- To learn how to play check the Learn to Conquer option in the main menu.
- To see the credits of the project player can check the credits option in the main menu

**Jar File:**

- Jar file of our game can be downloaded from this link.
- You must use “java -jar CS319H\_RISK.jar” in your respective terminal to run the game.
- You must have java 1.8 to run the jar file with.

## 5. Work Allocation

Everybody worked in every report. During our weekly meeting, two times a week, we distributed parts of the reports to every member and after completing their parts, members checked other members' works and helped them if necessary.

### **Rüzgar Ayan**

- Written OptionsMenu screen class
- Written three Manager classes
- Connected the logic between the application classes and screen classes
- Written the general game loop

### **Kaan Atakan Aray**

- Implemented win condition
- Implemented Sound Manager class
- Implemented continent bonus logic
- Implemented How To Play Menu class
- Implemented Pause Menu class
- Implemented Factions class
- Implemented Player class

### **Emre Derman**

- Implemented Sound manager Class
- Implemented map Class
- Implemented Bilkent Map file
- Implemented some methods in Card class
- Implemented some of the sound effects

### **Kamil Kaan Erkan**

- Prepared How to Play Screen Images
- Implemented How to Play Screen class
- Implemented Match class

**Cankat Anday Kadim**

- Implemented Menu abstract class
- Implemented Main Menu
- Implemented Game Starter Menu
- Implemented Game Screen
- Prepared the resources
- Prepared the musics
- Bug fixing

**Umut Ada Yürüten**

- Implemented Mission and Win Strategy classes
- Implemented Card class
- Implemented AI algorithms
- Implemented many functions of the Player class
- Implemented many functions of the Map and Region classes
- Implemented some functions of Match class
- Bug Testing