



**CS319 Object Oriented Software
Engineering
Project Final Report
First Iteration**

RISE OF EMPIRES

Group 2E

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1. Implementation Process

We implemented our program via using IntelliJ. Every member connected to the 2E-Risk repository from GitHub and the implementation process started after the first iteration of the design report. The reason we used IntelliJ was because this program can be linked directly to GitHub, so we did not have to use third programs to push, pull or commit. For the communications, the main meeting platform was Discord together with Whatsapp since we are not able to meet face to face.

The implementation stage began with each person drawing a picture for the interfaces. First, we created a main menu, and a new game function and then we draw pictures for each country. So in the first week, we spent our time drawing the pictures for our game. After the drawing part was done, we focused on the functionality of the game. Each person took a functionality and tried to implement it on their own. While we were implementing functionalities, some of us found pictures for the game objects and created their images for us. Most of the time Furkan worked on game functionalities and Ege worked on creating pictures. while Can and Muzaffer worked on functionalities and helped Ege when he needed help. After the pictures were done, Ege also started working on functionalities. At the end of our time for the project we finished what we promised for the functional requirements.

2. Changes in RISK

2.1 Continent System

Since we added countries, leaders and generals to our game and each have their unique buffs to them, the need for a continent buff seemed a little bit unnecessary. Totaled with the new addition of the new buffs we are implementing, we thought that continent buffs would give too much of an advantage and ended the game too fast.

2.2 Mission Card System

Now that the continent system is gone, the mission card system that depends on that system is a problem. In order to save players from trying to conquer continents while getting no buffs, we found that a research system would be a more valuable system for the players. Considering that wars are not won with having the most land but with soldiers and technology, removing the mission card system that heavily depends on getting lands seemed much more reasonable.

3. Improvements in Our Design

For the first design iteration since we didn't know what are the design patterns were, we couldn't add any of them. However, after some time passed during the

lecture we learnt Strategy Design Pattern and tried to fit it in our code. After seeing how useful it is we continue to use it and try to add it into possible spots in the code. Our second improvement was about Architectural patterns. We implemented our program with the MVC design pattern in mind via using controllers, interfaces and objects (ECB) in our most classes. In general we tried to keep our implementation as our design report however, the new ideas came with the time and the amount of time we worked with the code. Also, being a group of five also, took role to change the ideas.

4. Player Guide

4.1 System Requirements

RISE of Empires requires Java Virtual Machine and Java 8 SE. So, any player who has these in his/her computer is able to play with his/her friends.

4.2 Starting to the Game

Players are able to choose different options from the first screen Main Menu showed at 4.1.

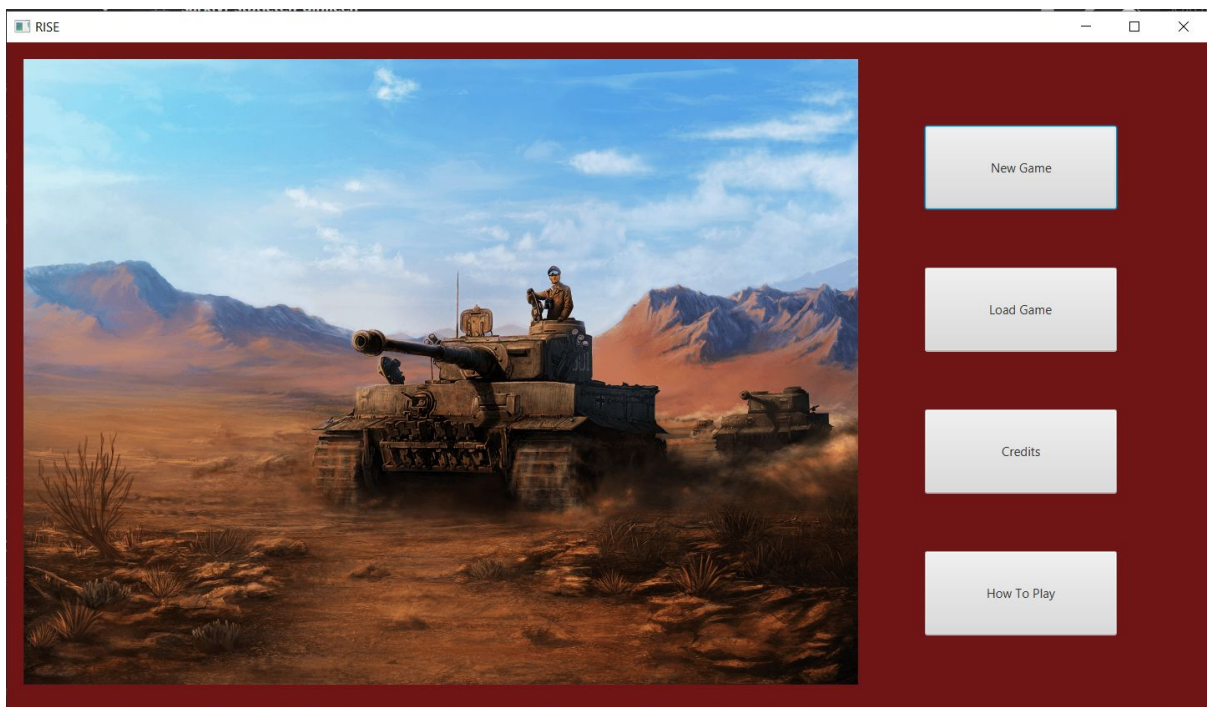


figure 1: Main Menu

In order to start a new game players should press the New Game button.

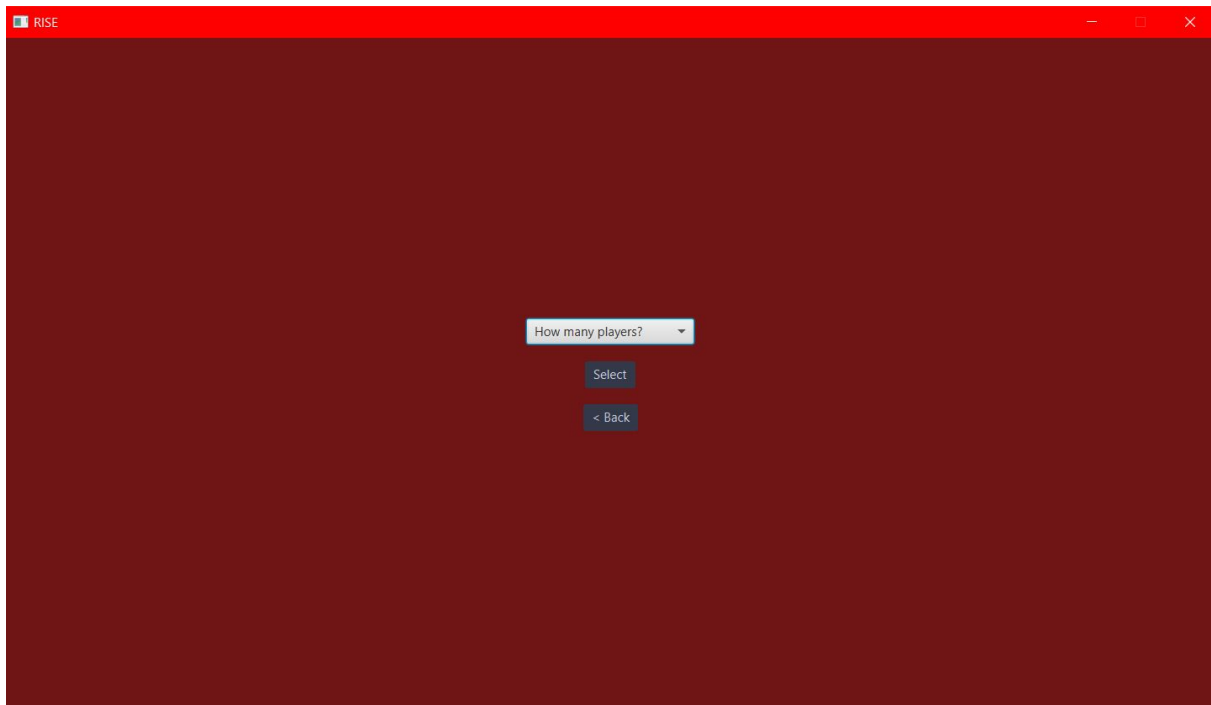


figure 2: Player count screen

After the New Game button this screen will be shown and here we asked Player to choose the player count.

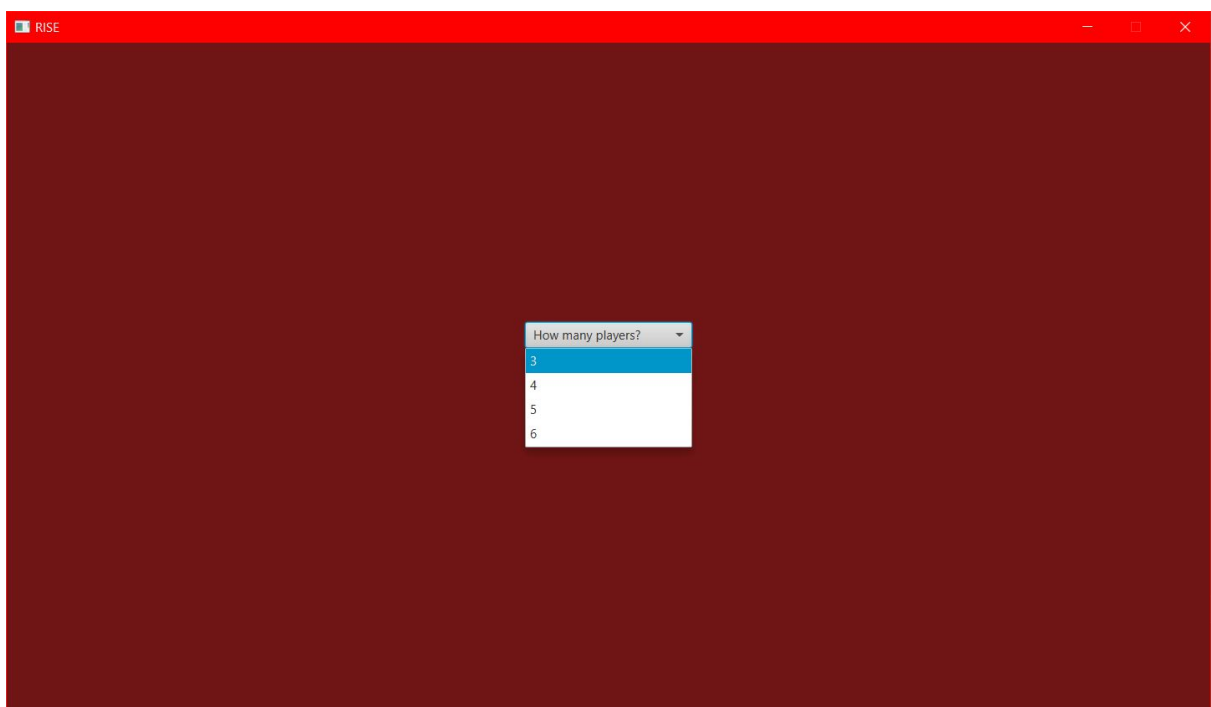


figure 3: Player count choosing screen

Player count can be between 3 - 6 so player should choose a number from the menu which appears after pressing the How many players?



figure 4: Country selection screen

After player count is entered and press the Select button Players will come to this screen above. Players will choose their preferred countries via the buttons on the left and They will be able to write their name via the left top text bar after simply deleting the text in it. Then they will look at the preferred Leader of that country from the menu under the name bar. In order to choose it Player should press the select button. For example in the screen below Player1 selected German Reich as a country and Adolf Hitler as leader.



figure 5: Leader selection screen

After this screen Player will press ready to let remaining players to choose their preferred country and leader. After everyone chooses the game will start.

4.3 Game Process

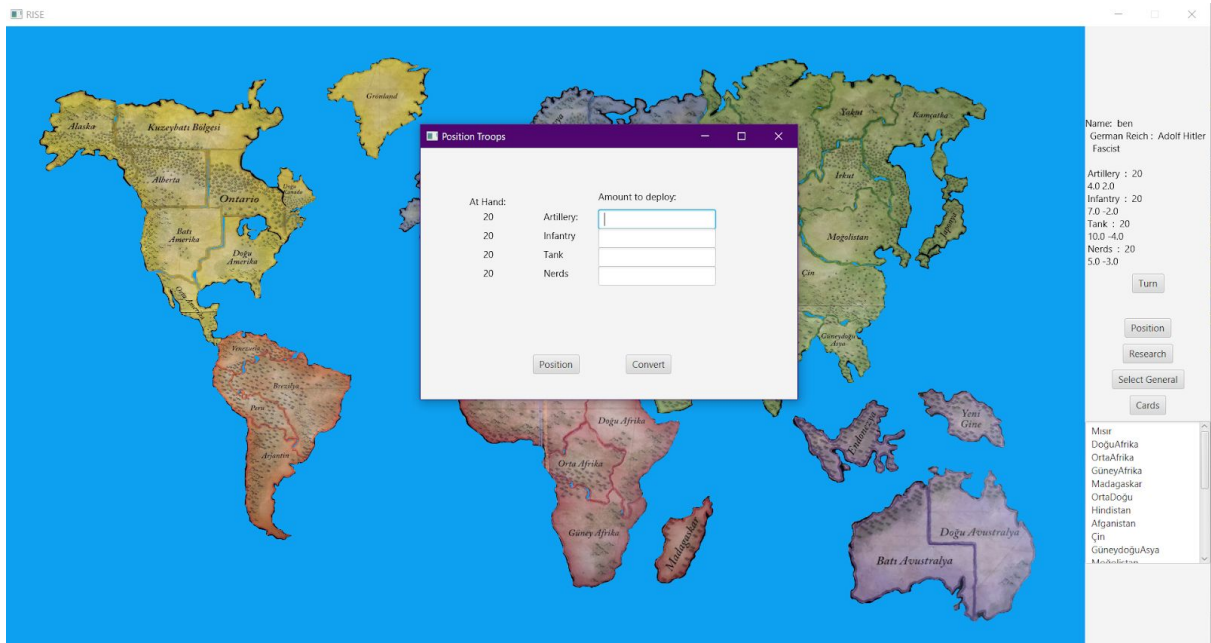


figure 6: Game screen with position/convert pop up

When the game starts this screen will be the first screen Players will see and player1 will start the game with positioning his/her troops. In the pop-up screen and the right side of the screen player will be able to see how much and which type troops s/he has.

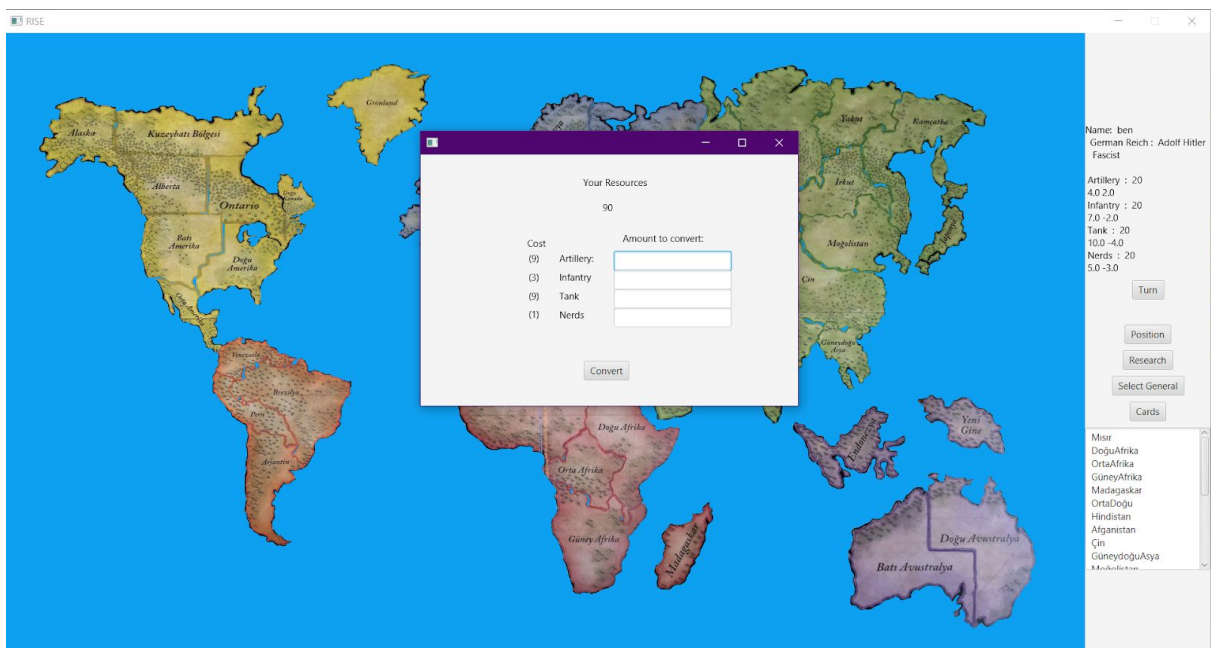


figure 7: Game screen with conversion pop up

Players are able to convert types to other types according to resources s/he has via pressing the button Convert on Position screen.

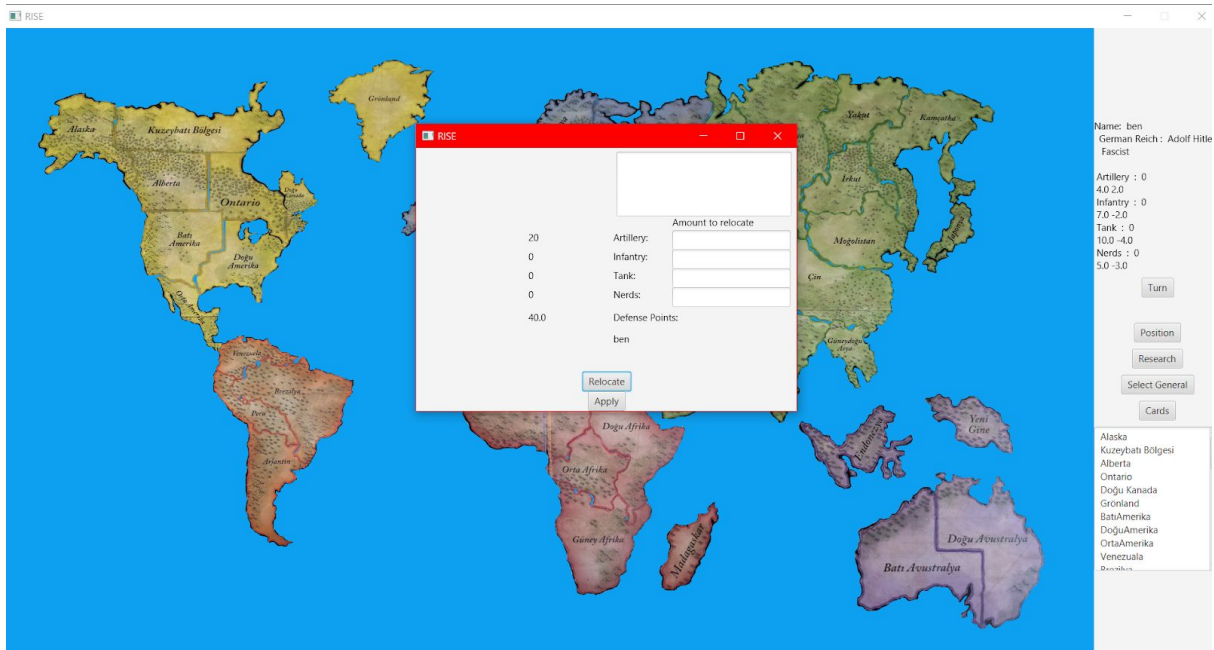


figure 8: Game screen with reallocation pop up

The screen above is a reallocation screen when a player presses his/her own country which has troops in it the player will be able to relocate them. In order to relocate, the player should press the relocate button once and then the bars which the player enters count of the troops s/he allocate become enabled. Pressing the apply button will make troops allocatable and then pressing the country player will be reallocated them.

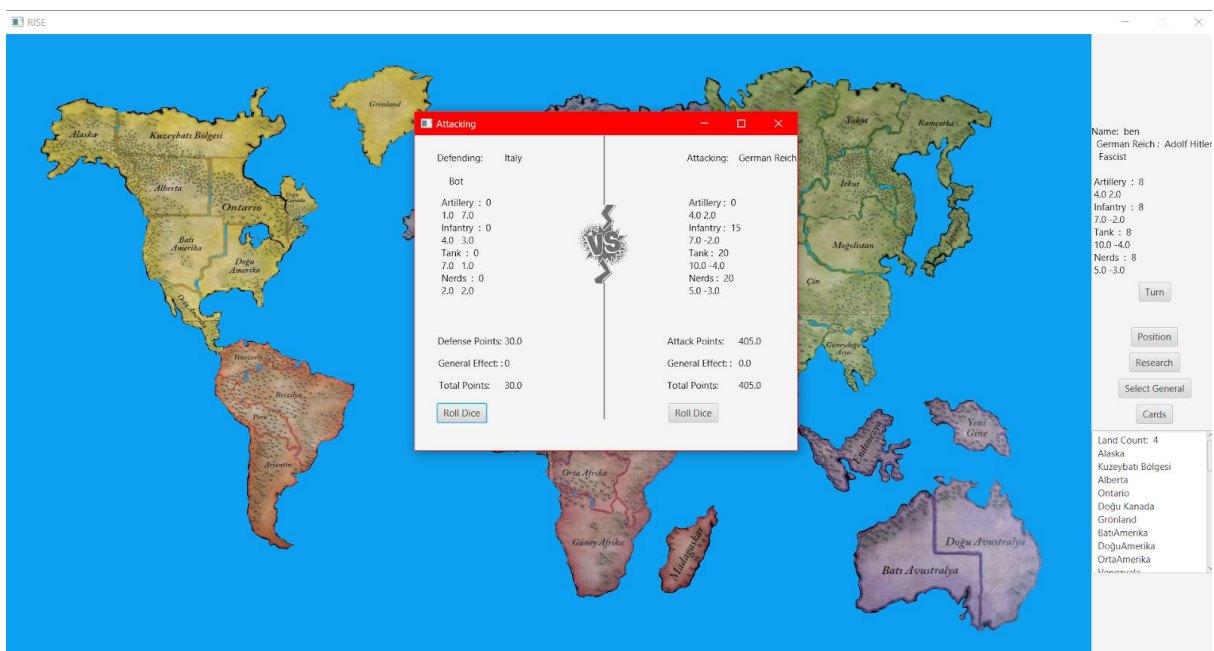


figure 9: Game screen with attack pop up

When a player in this case “ben”(German Reich) reallocates his/her troops to enemy land in this case “biz”(USA) this attacking screen will pop-up. And players will see how much they have attack & defence points and troop counts & types.

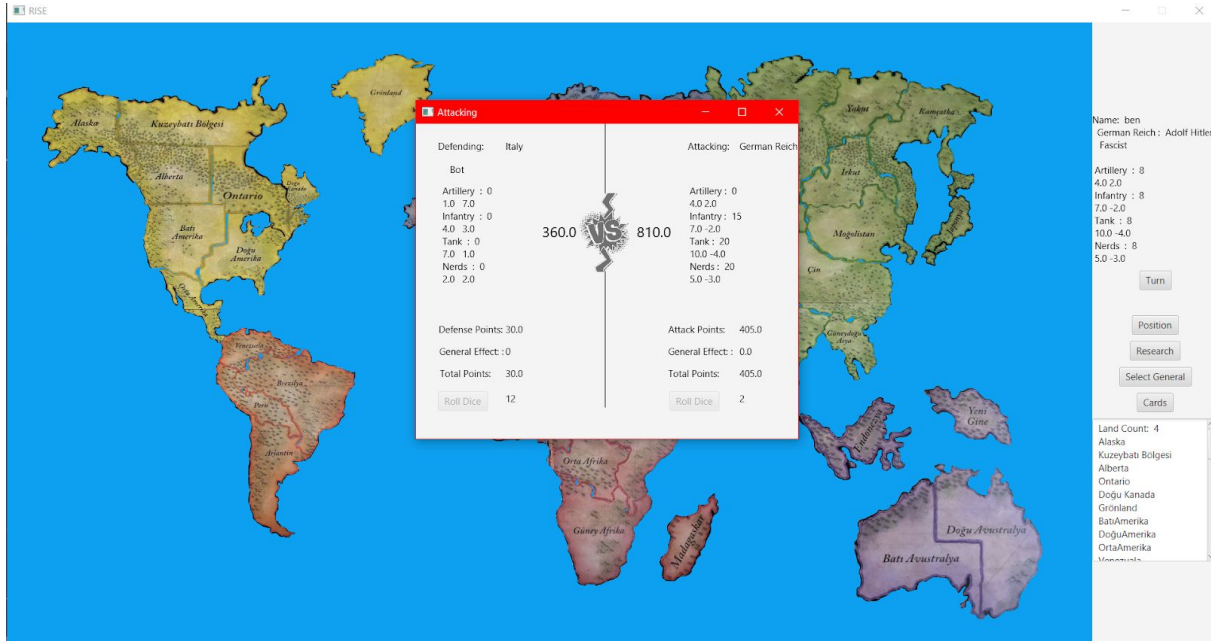


figure 10: Game screen with attack after roll dice pop up

After the roll dice button is pressed by the two player total defence and total attack points are calculated. And one of the following 4 conditions will happen between human - human wars:

T.C. = Troop Count

- 1 - Attacker Wins. Attacker T.C. > Defender T.C.
 ⇒ Attacker will LOSE Defender T.C
 ⇒ Defender will LOSE all troops
- 2 - Attacker Wins. Attacker T.C. <= Defender T.C.
 ⇒ Attacker will LOSE %80 of all troops
 ⇒ Defender will LOSE all troops
- 3 - Defender Wins. Defender T.C. < Attacker T.C.
 ⇒ Attacker will LOSE %80 of all troops
 ⇒ Defender will LOSE %50 of all troops
- 4 - Defender Wins. Defender T.C. >= Attacker T.C.
 ⇒ Attacker will LOSE all troops
 ⇒ Defender will LOSE Attacker T.C.

As to human - bot wars:

- 1 - Attacker Wins. Attacker T.C > BOT T.C
⇒ Attacker will LOSE %20 of all troops
- 2 - BOT Wins. Attacker T.C > BOT T.C
⇒ Attacker will LOSE %80 of all troops



figure 11: Game screen with defeat screen

If a player loses all of his/her lands in this case ("France") this screen will pop up.



figure 12: Game ending screen

If there is no player left except the winner in this case “ben with German Reich” player in the map this screen will be shown.

4.4 How to Play



figure 13: How to play screen

After pressing the How to Play button from the Main Menu this screen will be shown to the player. In the How to Play section, the players will be able to learn how to play the game. To clarify, in this section, the purpose of the game, how the buttons work, how the players can attack, defend and roll a dice, how to research etc will be demonstrated so that if the players want to learn how to play the game or get confused by the new stuff we added they can always come here and learn what they can do! We will be using images in this section to guide the players. Arrows will be used to show the player which component is where and what they do. Next button will show the next image, the prev button will show the previous image. This way the player will be able to navigate between the images easily. Back button is used to go back to the Main Menu.

4.5 Credits



figure 14: Credits screen

After pressing the Credits button from the Main Menu this screen will be shown to the player. By the buttons above like Design Team, Directors etc. player will be able to choose the credits s/he wants to see. And by simply pressing the back he will go back to the Main Menu.

5. What is Missing

We managed to finish our game according to functional requirements we promised. A problem we encountered was that while loading a saved game, card images were loaded blank. Card mechanics still works but the images are blank. It is due to the Serializable interface of java. Serializable is used to save classes, variables, etc., but javafx.Image cannot be saved directly. It requires java.awt.Image.image

which we learned this a little late. Thus, card images are not loaded in a loaded game, but works in a new game.

6. Conclusion

In general, we believe we did a great job. Because we know that we did what we could in this limited time. Via combining what we learnt till this time about coding and the knowledge we gained from Object - Oriented Software Engineering classes we tried to do our best for RISE. The hardest part of this project was for sure sustaining the group work. As it is expected, for a group project dividing the workload between members was good. However, when a member fails to do his duty the whole project stops if that duty is a key point even if it is not the others doing his job to proceed in the project. Also, during the project keeping the communication level high through social platforms was hard too because finding times that everyone is available was hard. But we managed to succeed except minor misfortunes. To summarize, we believe that we did a great job for RISE of Empire.