BILKENT UNIVERSITY
DEPARTMENT OF COMPUTER ENGINEERING

CS319 - Object-Oriented Software Engineering

Project Name: Seven Wonders

Analysis Report

Group No: 2G
Ömer Faruk Oflaz
Deniz Doğanay
Safa Alperen Oruç
Göktuğ Öztürkcan
Ahmet Berk Eren

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Analysis Report

1. Introduction

Seven Wonders is a board game in which player needs to advance the wonder in terms of several aspects and collect the most victory points to win the game. It features representations of ancient civilizations, military conflicts and economic activity. The game can be played with 2-7 players. There are seven ancient wonders from where game's name comes and each player chooses one of these wonders to compete with each other by developing it.

In this project, our purpose is to digitalize the Seven Wonders board game to make it more attractive and funny.

2. Current System

Seven Wonders is a board game created by Antoine Bauza in 2010 and originally published by Repos Production in Belgium. There are seven 'Wonder Board'. The game includes a card drafting mechanic and three decks of cards, which represent different ages I,II and III. In each age, 7 cards are randomly dealt to each player. Once per turn, each player selects a card to play from their hand, then passes the remaining cards.

3. Overview

3.1. Cards

The main component of the game is cards. There are seven types of age cards, representing different types of structures, which are determined by the color of their background: Red cards (military structures), yellow cards (commercial structures), green cards (scientific structures), blue cards (civic structures), brown cards (raw materials), grey cards (manufactured goods), purple cards (guilds).

3.2. Wonder Board

There are seven 'Wonder Board', each of which are depictions of Antipater of Sidon's original Seven Wonders of the Ancient World. Each board has two different sides selected before the game by players. There are 3 steps on each side to complete.

3.3. Coin

Coin is used for commercial stuff in the game. Players can purchase items from neighbours by using coins.

3.4. Conflict tokens

Conflict tokens are used when an age is over. After finishing the first and second ages, conflict tokens are taken regarding neighboring cities' military situation comparing each other. If a player has a higher total than that of a neighboring city, that player takes a Victory token corresponding to the Age which just ended (Age I: +1, Age II: +3 or Age III: +5)
If a player has a lower total than that of a neighboring city, that player takes a Defeat token (-1 victory point)

4. Functional Requirements

4.1. Play Game

The user can play the game against 3 bot players. If the user get the most victory points against these opponents, the user wins the game.

5. Non-functional Requirements

5.1. Usability

The users can easily play a game via technological device. They do not carry the deck in their hand and easily pick a card on the screen by clicking. If the user even does not know how to play this game, then s/he can take a look at 'how to play' section of the main menu and easily get the point.

5.2. Supportability

Digital version of this game can run on any device Java installed owing to the Java Virtual Machine.

6. System Model

6.1. Use Case Model

This part gives information about the main use case model of Seven Wonders and detailed explanations of the use case model.

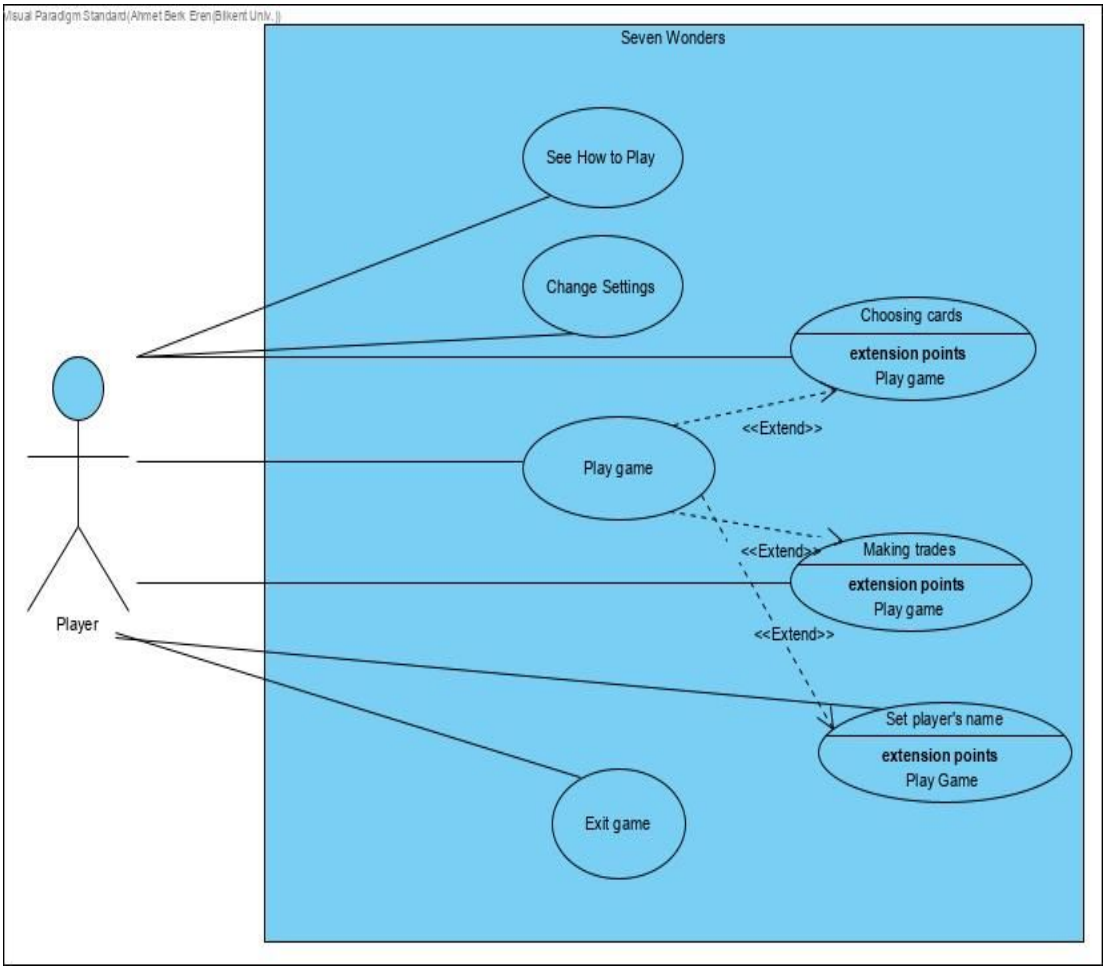


Figure 6.1 - Illustrates the use case model of Seven Wonders

6.1.1. See How to Play

Use Case Name: See How to Play
Primary Actor: Player

Stakeholders and Interests:

- Player doesn't know the game and wants to learn how to play.
- System shows the description of the game.

Entry Condition: Player selects "How to Play" from Main Menu.
Exit Condition: Player selects "Main menu" to return to the main menu.

Success Scenario Event Flow:

1. System shows the description of the game.

Alternative Flows:

A. If the actor wants to return main menu:
   A.1. Actor selects "Main Menu" to return main menu.
   A.2. System shows main menu.

6.1.2. Change Settings

Use Case Name: Change Settings

Primary Actor: Player

Stakeholders and Interests:

- Player wants to disabling game sounds or enabling game sounds.
- System updates itself according to player's choices.

Pre-condition: For first time running, game options will be set as default.

Post-condition: Game settings are updated.

Entry Condition: Player clicks “Options” from the main menu or pause menu.
Exit Condition: Player selects “Save” to return menu.

Success Scenario Event Flow:

1. Player selects and enter to “Options”.
2. Game options will be displayed inside of Option screen.
3. Player make changes to the options according to his or her desires.
4. System updates the new settings.

Alternative Flows:

A. If player wants to return menu:
   A.1. Player selects “Save” from the screen.
   A.2. Game settings are updated.
   A.3. Player returns the menu.

6.1.3. Play Game

Use Case Name: Play Game

Primary Actor: Player

Stakeholders and Interests:

- The main goal of the game is collecting the more victory points than other players.

Pre-condition: For the first time running, options will be set as default.
Post-condition: Winner of the game will be announced.

Entry Condition: Player selects “Start Game” from the main menu.
Exit Condition: Player selects “Return to main menu” from pause menu.

Success Scenario Event Flow:

1. Player set his or her nickname.
2. Game starts and every player gets a wonder randomly.
3. Game starts at first age.
4. Players begin to choose a card and send the others to the next to them.
5. This flow of cards continues until each player gets 6 cards in an age.
6. At the end of the age each player makes battles with his or her neighbors.
   Game repeats the steps 4-5 three times to finish all ages.
7. System calculates each player's victory points.
8. Announce the winner and leaderboard.

Alternative Flows:

A. Player wants to exit game before finishing the game:
   A.1. Player pauses the game.
   A.2. Player selects "Return main menu".
   A.3. System shows the main menu.

6.1.4. Exit Game

Use Case Name: Exit Game
Primary Actor: Player

Stakeholders and Interests:

- Player wants to close the game.

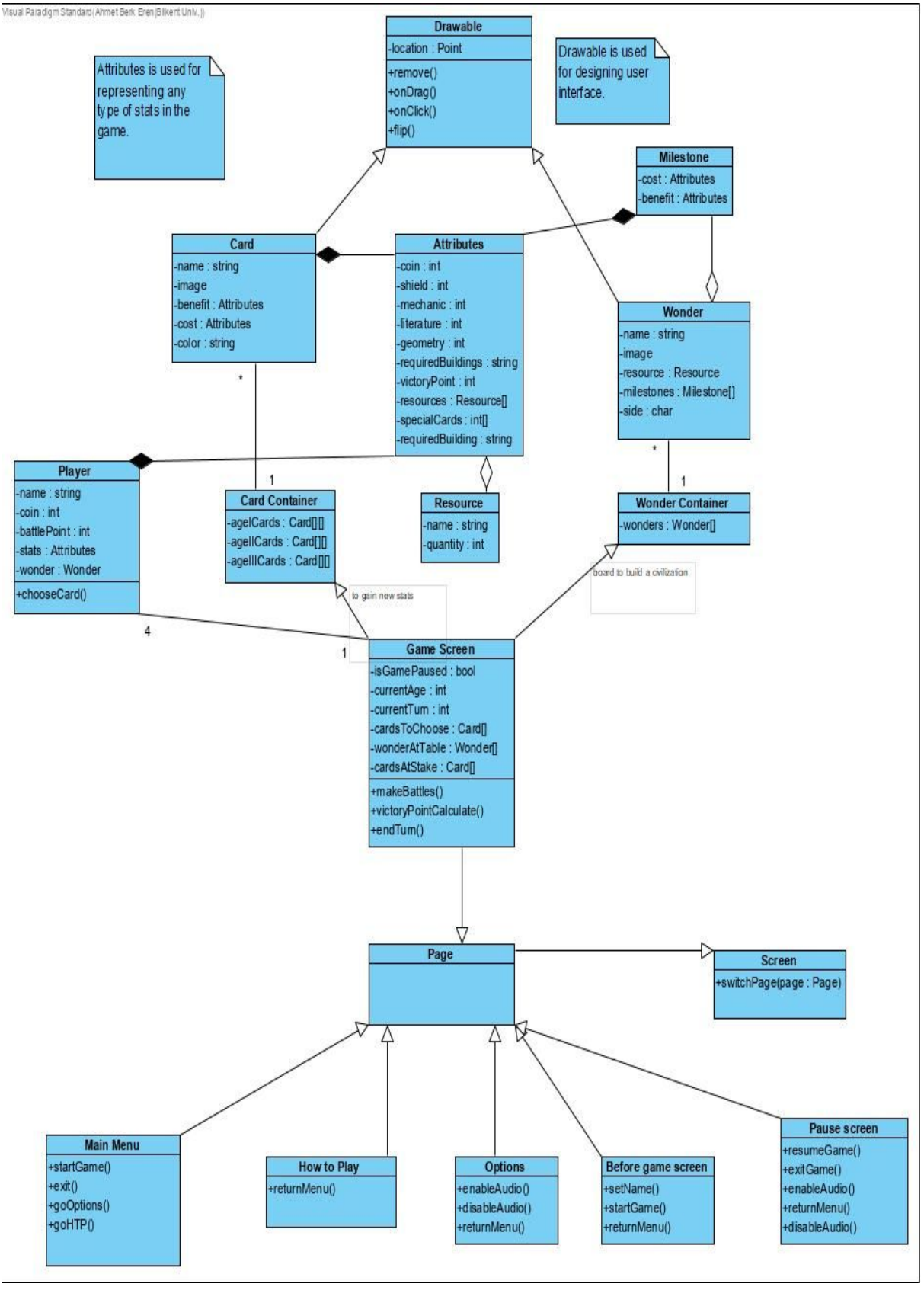
Pre-condition: Player should be in the main menu.

Entry Condition: Player selects "Exit Game" from the main menu.

Success Scenario:

1. Player selects "Exit Game" from the main menu.
2. System close the game.

6.2. Class Diagram



6.3. Dynamic Models

6.3.1 Sequence Diagram

6.3.1.1. Options

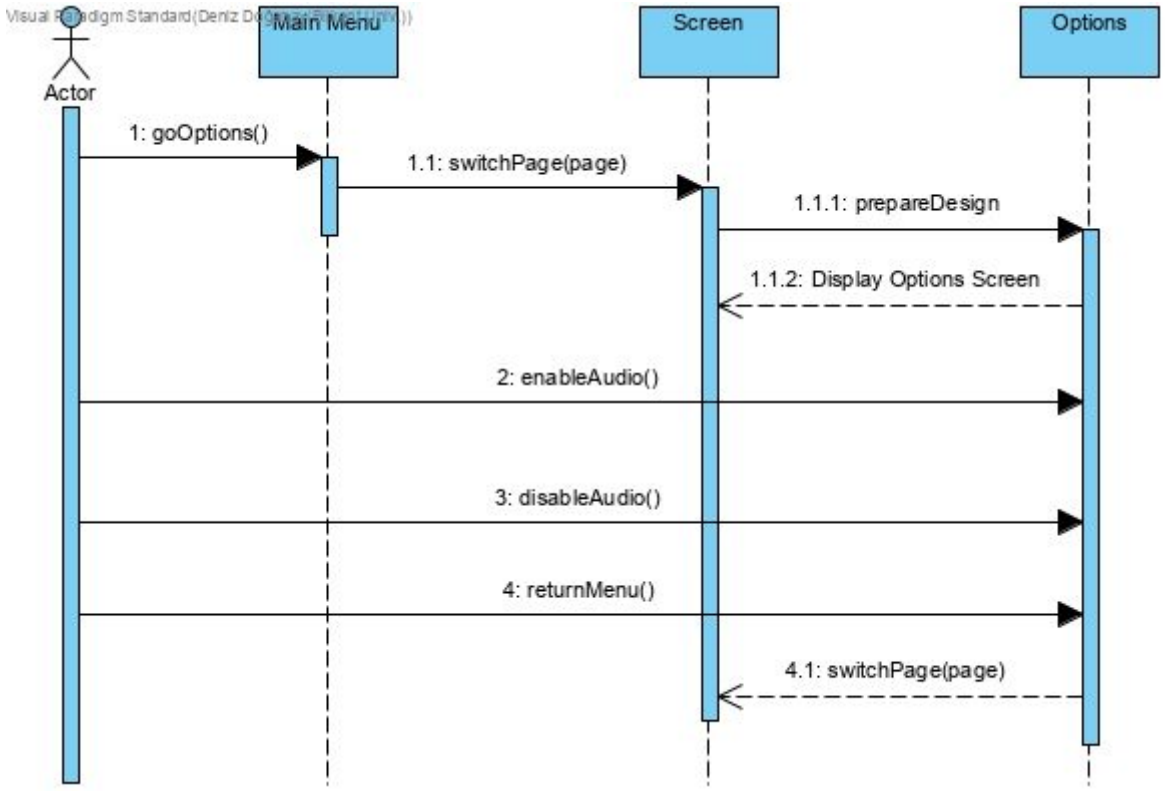


Figure 6.3.1.1 - Sequence diagram for Options

Options is the screen in which the user can enable or disable audio, and go back to main menu.

6.3.1.2. How To Play

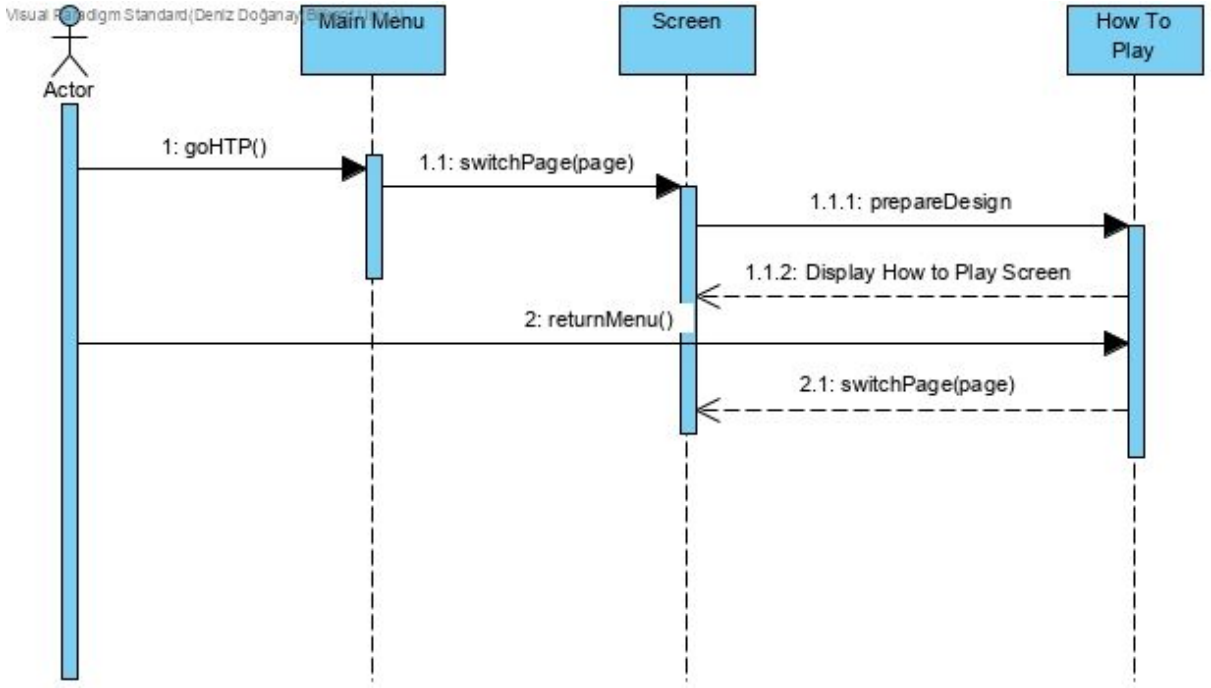


Figure 6.3.1.2 - Sequence diagram for How to Play

How to play is the screen where the user can learn about the game mechanics. The user can go back to main menu from here.

6.3.1.3 Play Game

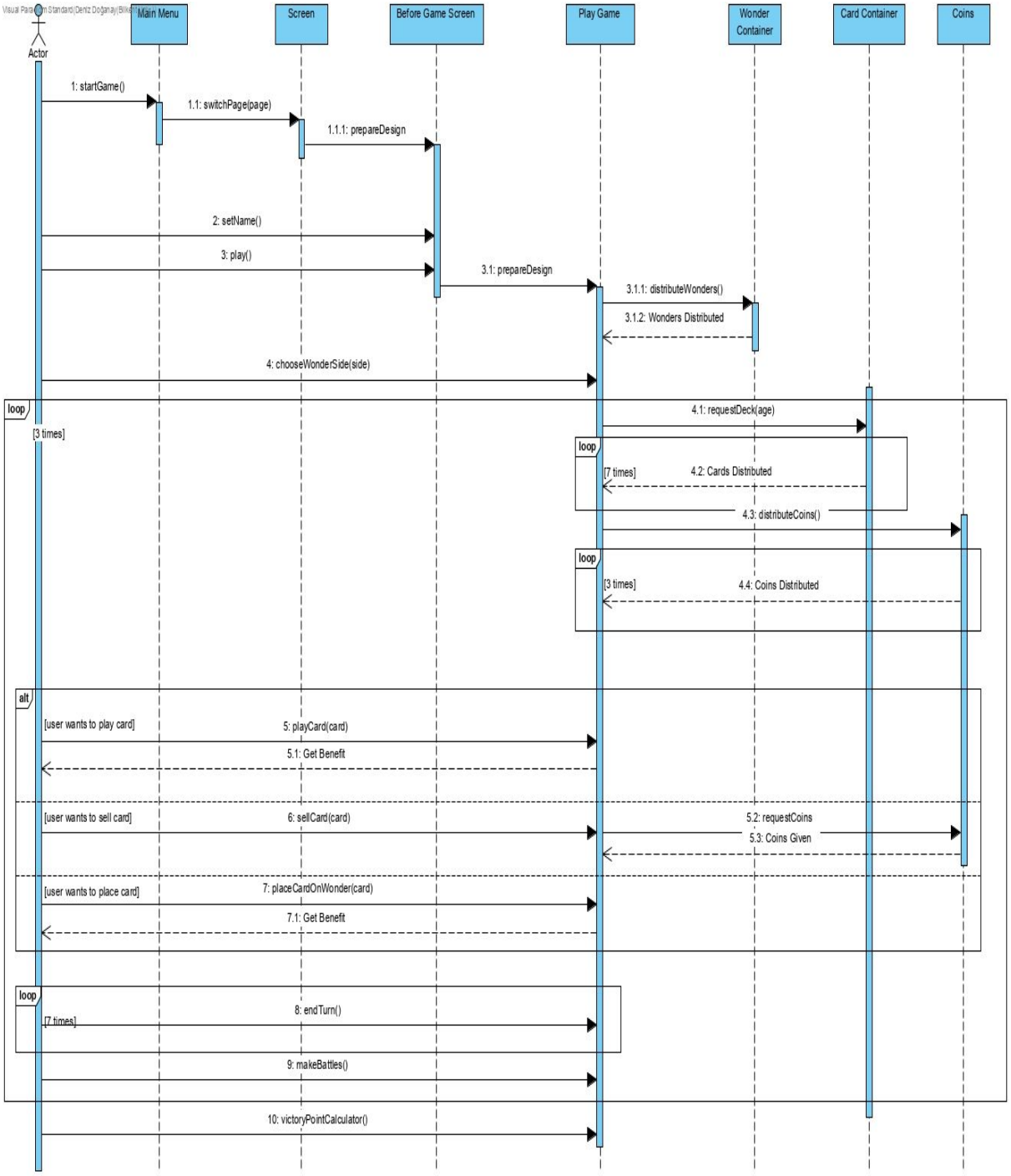


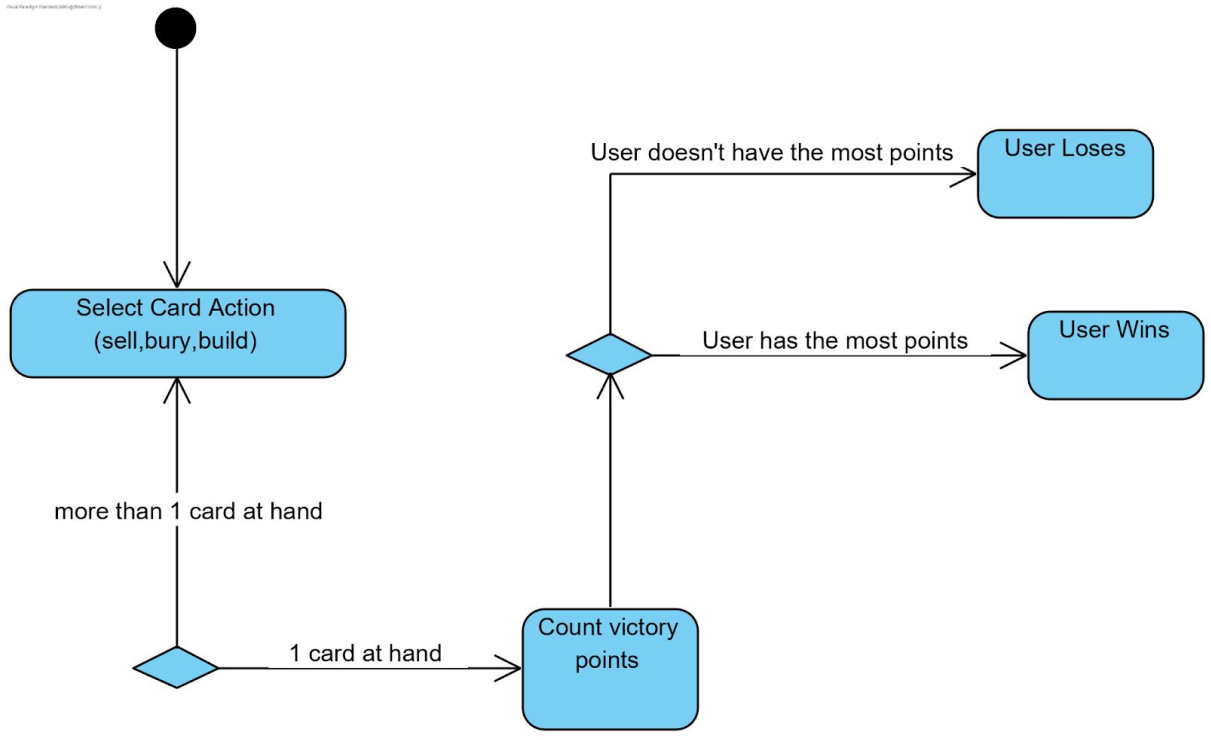
Figure 6.3.1.3 - Sequence diagram for Play Game

When the user starts playing the game, Before Game Screen shows up, where the user sets their nickname. After entering the nickname, the game begins, wonders are distributed and the user

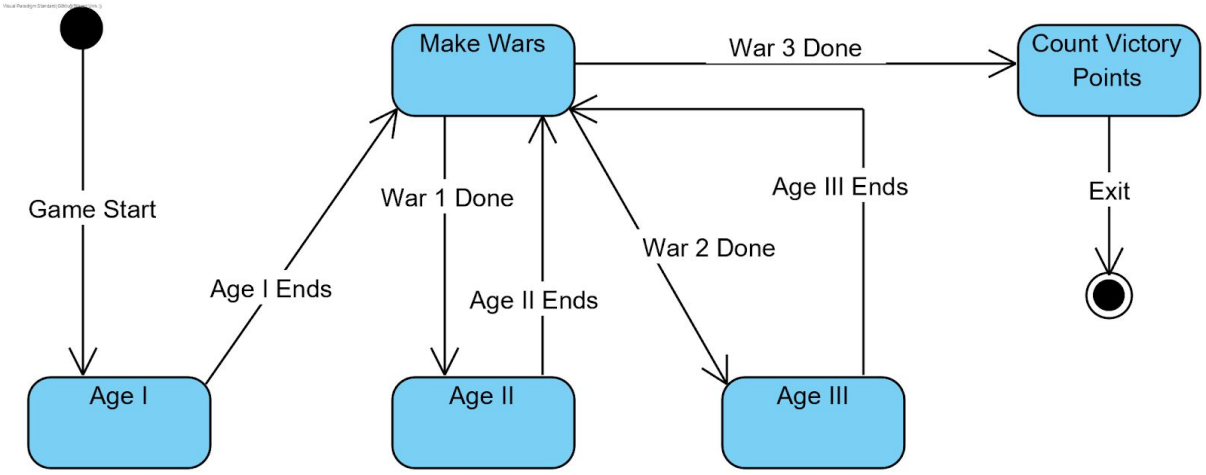
chooses side A or B of the wonder they got. Then, 7 of Age I cards and 3 coins are distributed to each player. Each turn, the user has 3 options; either play a card, sell a card, or place card on their wonder, if required conditions are met. User gets 3 coins if they choose to sell the card; or gets specific benefits, if they choose to play the card or place the card. After the user makes their choice, they pass the remaining cards to the player right to them, and get remaining cards from the player left to them. This process goes on 7 times, until all cards in play are used up. Battles take place against left and right players. Then the next age begins with the specific age cards. After all 3 ages are completed in this way, each player's victory points are calculated and the winner is decided.

6.3.2. State Diagram

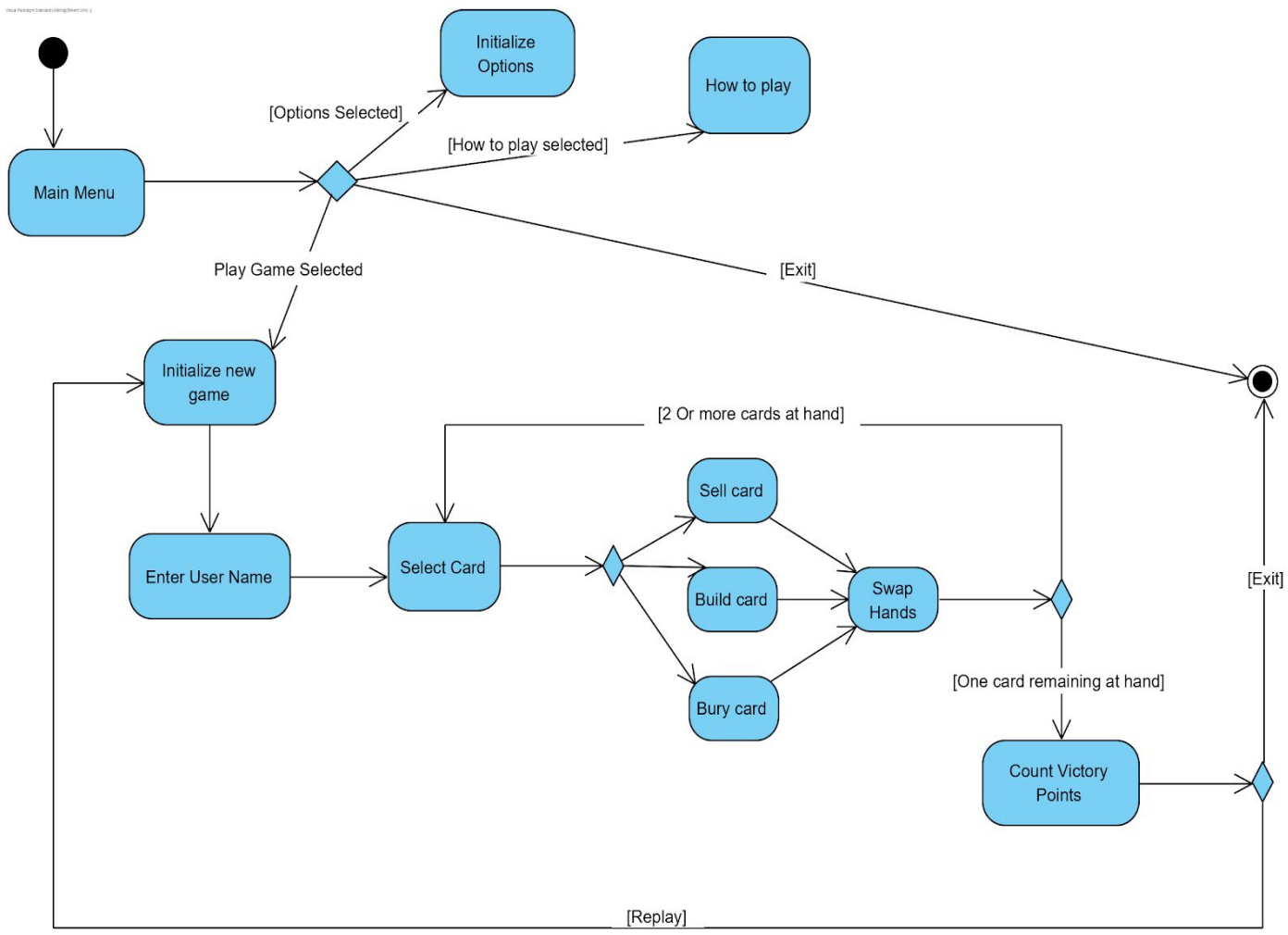
6.3.2.1 Winning and Losing Condition



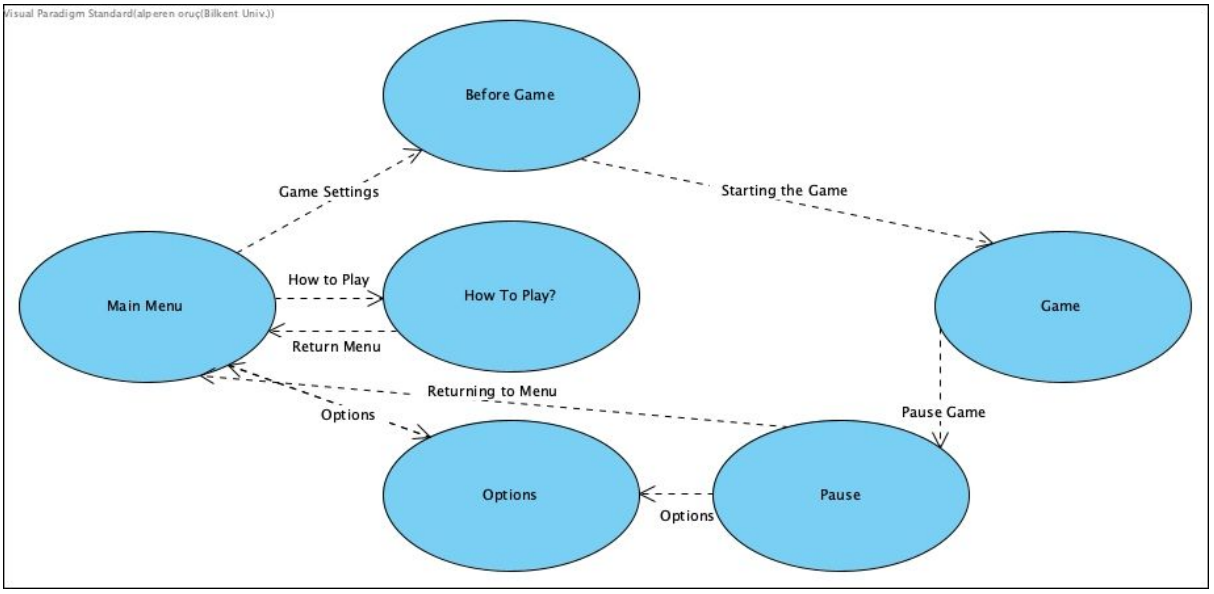
6.3.2.2 State Diagram for Wars and Ages



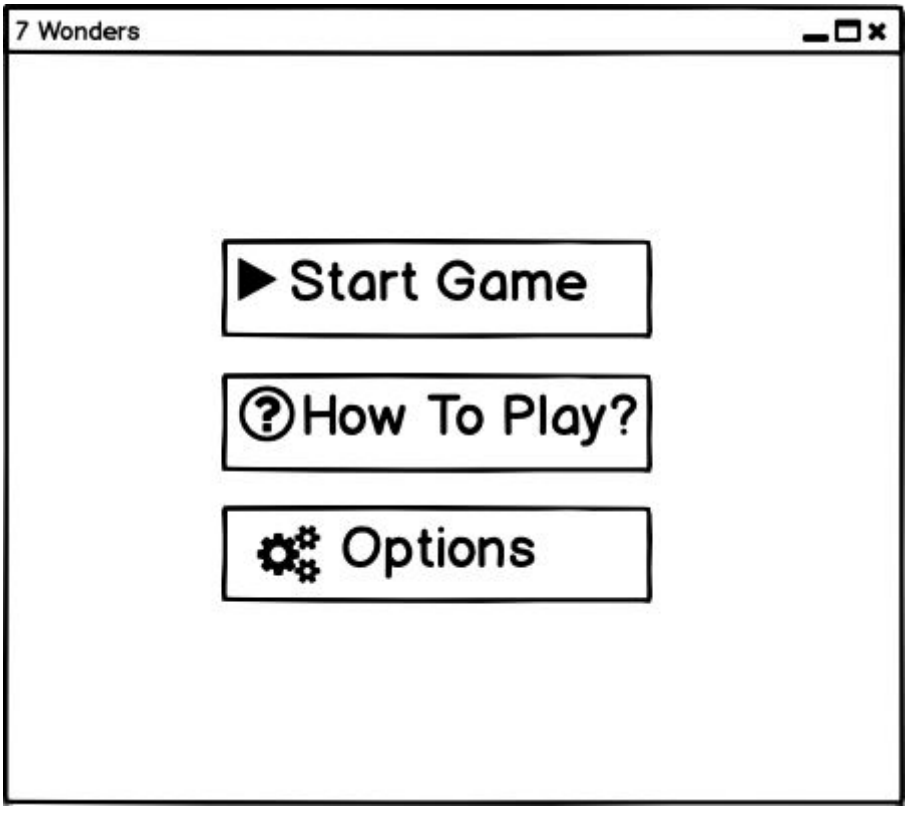
6.3.3 Activity Diagram



6.3.4 User Interface

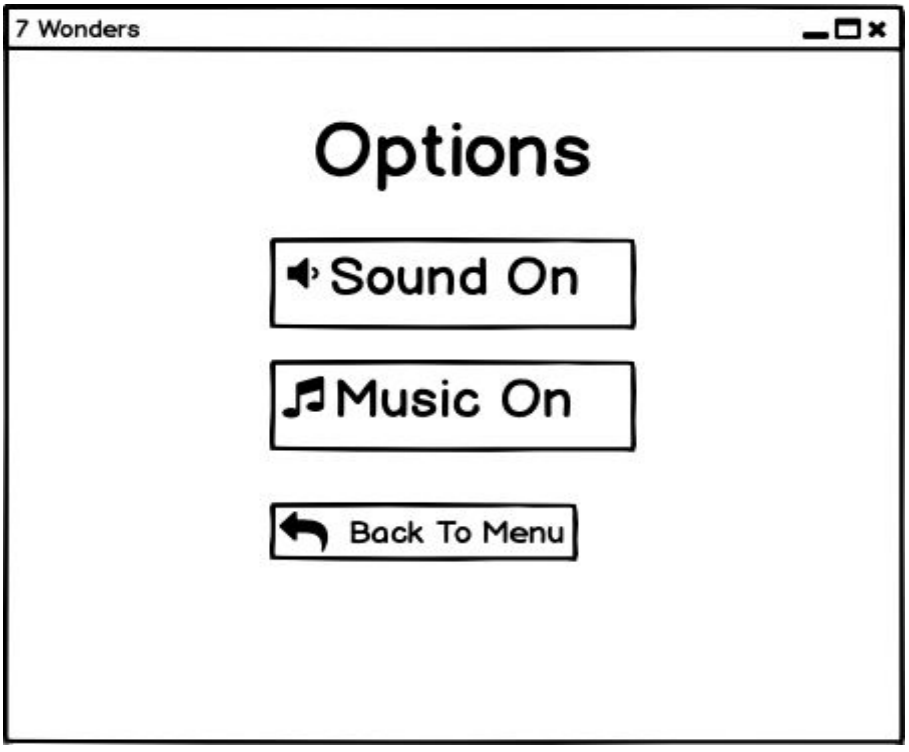


Main Menu Screen

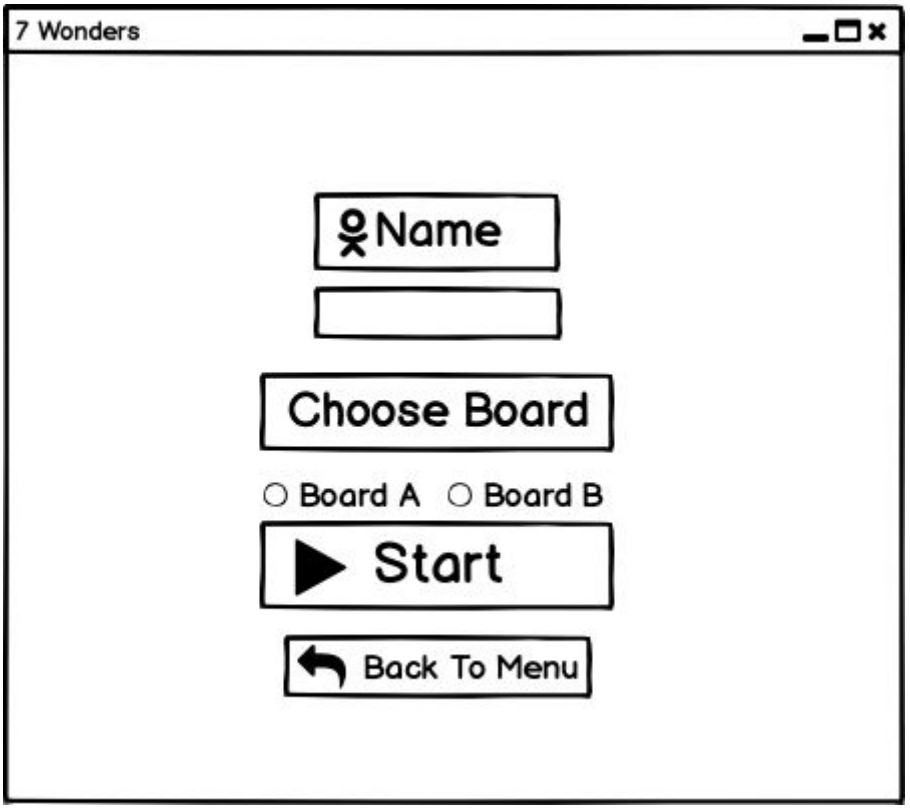


How To Play? Screen

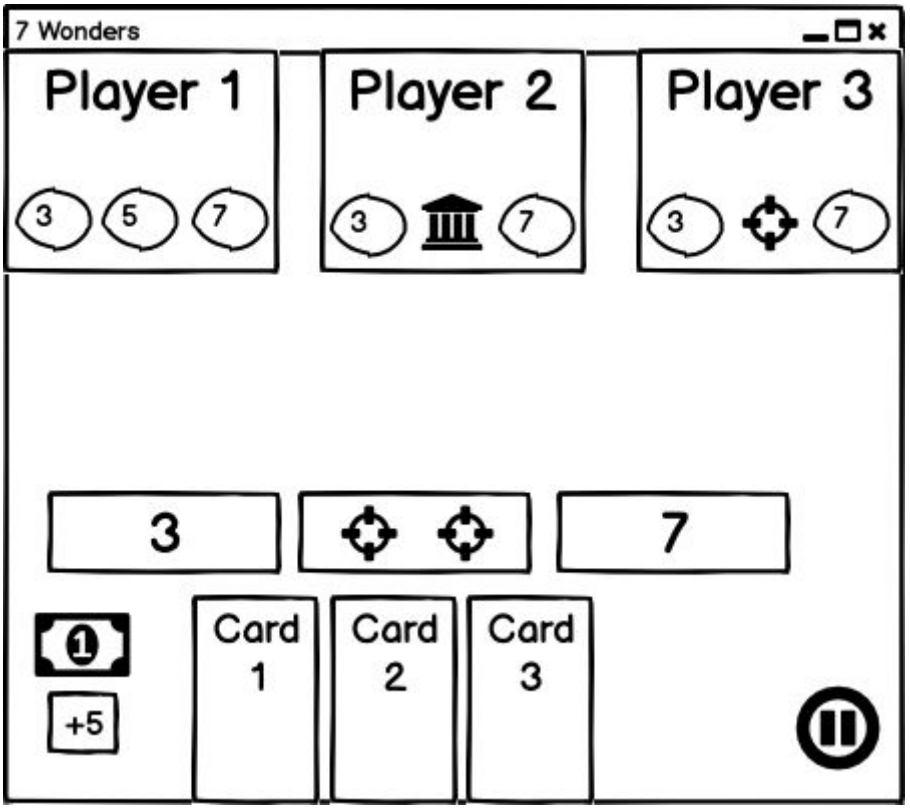
Options Screen



Before Game Screen



Game Screen



Pause Game Screen