



CS 319 Project Final Report

Monopoly Sicilia

Group 2D

**Asya Doğa Özer - 21803479**

**Ufuk Palpas - 21702958**

**Uğur Utku Seyfeli - 21802239**

**Yiğit Harun - 21803241**

**Oğuz Orhun Tüzgen - 21802313**

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# **1.Implementation Process**

The implementation process of Monopoly Sicilia started after finishing the class diagram in the first iteration. Each group member downloaded IntelliJ IDEA as an IDE. Then cloned our GitHub repository named 2D-Monopoly which was created by Oğuz in the beginning, to each of our computers. Each of us created branches for specific features and worked on that branch. After each new implementation, we committed our changes to our own branches and after important changes that will significantly affect others, one of us merged his code with each of our branches respectively. Then, we pulled that merged code to our branches. GitHub was useful to track each others' code and history and also to combine our codes and we used the rollback feature to undo our unintended pushes. We posted some of our long-lasting bugs to Github issues and tracked the progress from there. Besides GitHub, we used Discord as a voice channel and a screen-sharing app to communicate with each other.

We divided the tasks into small parts and in the beginning, only one small part is given to one of us. After one finishes her/his part, s/he got another part to work on. In some parts that require more job, we are divided into subgroups. Two or three members together dealt with those big parts. We used the IntelliJ plugin called CodeWithMe to edit a file simultaneously in real time. In challenging parts and debugging we worked together to solve the problem. Also when merging our codes, we worked together.

## **1.1.System Requirements**

Monopoly Sicilia will be able to installed and run on any computer that has  
JDK (Java Virtual Machine) and Java SDK.

## **1.2. Installation**

Monopoly Sicilia can be installed using [this link](#). The project can be downloaded as zip or cloned. And then it can be compiled and run using the Java 8 Compiler. If you are using an IDE, open the "2d-monopoly/" subdirectory and select the "2d-monopoly/src/Main.java" file as the Main class. The link also includes our Design and Analysis reports. For further information about our implementation they can be checked.

## **2. Changes and Improvements**

In the implementation stage of our game, we made various alterations in game logic and rules to make it more funny, playable and gripping. These changes can be seen in various parts of the game such as new features or some improvements in an existing feature. The improvements and changes are listed below.

### **2.1. Mafia Improvements**

In the implementation stage of the game, we thought that mafia can provide a way to jailbreak. Therefore, we put a buy jailbreak card option from mafia to the game. So that players do not need to wait until they throw doubles on any time in succession. However, they need to pay the mafia for this card. Furthermore, in our previous reports we talked about the blackmail option as stealing money from other players however, during the implementation stage we added one another detail for this feature. Now, mafia may also steal the 15% of the money who deals with the mafia, however this occurs in 25% of the deals. This feature is added to avoid players to deal with mafia continuously and disrupt the game logic.

## **2.2. Power-Up Improvements**

In the previous reports, we didn't mention about how many power-ups can be applied to a player at the same time. To avoid disruption of the game flow we added 2 limitations to these power-ups usage. These are: First, if a player used earning power-up for a specific number of turns, the player cannot use another earning power-up at the same time. Secondly, If a player is slowed down by a power-up, the same person cannot be slowed down again by another slow down power-up until the effect of the first power-up ends.

## **2.3. Forex Improvements**

In the previous reports, we talked about that our forex system is affected by the forex operations of the players. We also added that at the end of each turn, forex rates also fluctuate. This makes the forex system more active and also encourages players to invest in other currencies.

## **2.4. Trade Improvements**

We added a more sophisticated trade system. With the help of this new system players can offer tiles to each other and also they can add money besides the tiles. Furthermore, the same way players can offer money or/and tiles in return for. However, they cannot give only money to each other. This new trade system improves the functionality of the game and also it simulates the real world cases for the Monopoly game.

## **2.5. House and Hotel Improvements**

Previously while we were thinking that hotels and houses can be built when the player is on a tile with the same color group however, at the implementation tile we changed it. Now, players can build houses and hotels everywhere so that game flow speeds up. However, the player still needs to have all tiles in the same color to build a house.

## **2.6. End Condition Changes**

Similar to Monopoly Millionaire our game will finish when anybody reaches a million or if there are 3 players signed out or bankrupted.

## **2.7. Jail Improvements**

While we were writing the previous reports we had thought that throwing doubles on any of your next three turns, using the "Get Out of Jail Free" card if you have it, was the end condition of the jail state. However, after the implementation we decided that the player should not leave the jail after 3 turns and the player needs to throw doubles in jail to leave or the "Get out of Jail Free" card. Also we added one new feature to escape from the jail. The players need to pay mafia so that they can escape from the jail any time when they are arrested.

## **2.8. Tax improvements**

In our previous reports, we had written that tax amount is determined according to a percentage of the total money of the player. However, in the implementation of the game we thought that this may disturb the games flow because percentages may be too high as a percentage. Therefore, we changed them with constant, determined amounts.

## **2.9 Resign & Bankrupt Changes**

Unlike Monopoly Classic, it is possible to resign from our game. Bankruptcy happens when you have no money. It does not matter if you have tiles or not. This feature is similar to real world real estate trading. In order to not get bankrupted player has to sell their tiles, if they have any, before they got bankrupted.

## 2.10 Miscellaneous Improvements

From classic Monopoly, we removed the case where a player can roll the dice as long as they roll a double dice. (e.g. 5, 5)

## 3. User's Guide

### 3.1. How to start

The game starts with this screen. Players can choose between starting a new game, how to play, settings, credits, loading a saved game, or exiting the game.



Figure 3.1: Main menu screen.

### 3.2. Settings



This screen comes up when the settings button at the start screen is clicked. The game can be converted to colorblind mode and sound can be muted. Or, by clicking the go back button it can be returned to the start screen.

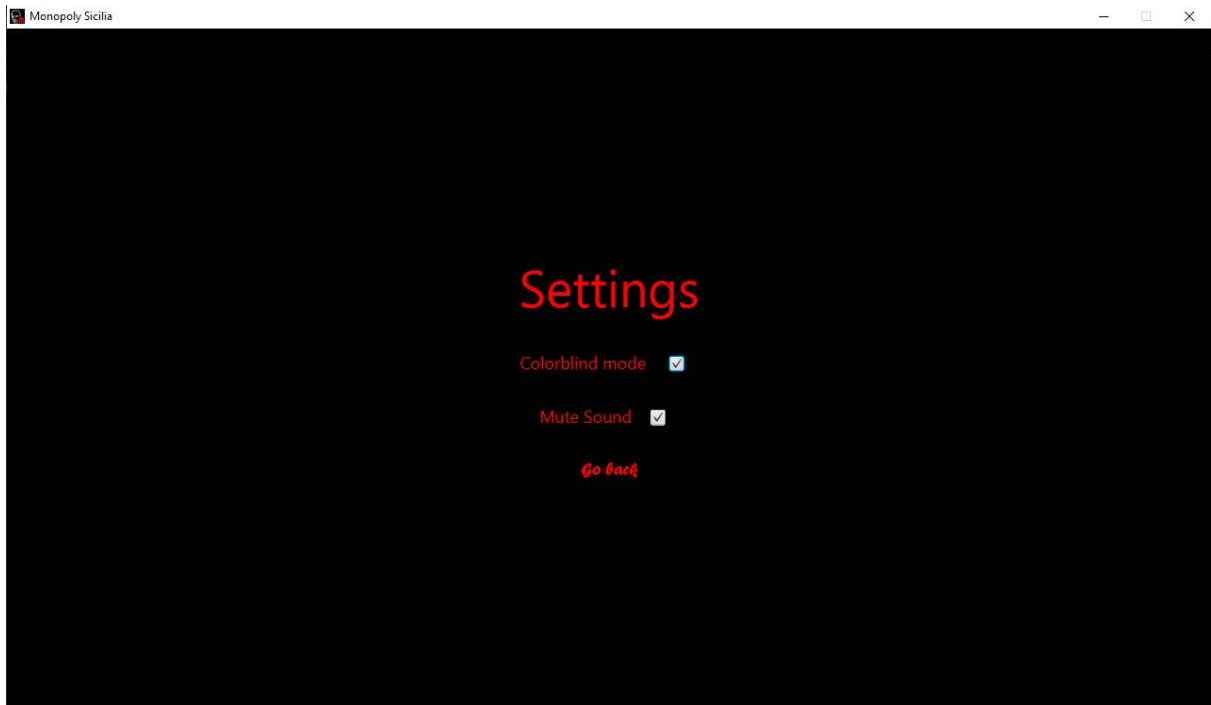


Figure 3.2: Settings menu screen.

### 3.3. Credits

This screen comes up when the credits button at the start screen is clicked. It shows the credits of the game.



Figure 3.3: Credits menu screen.

### 3.4. Choosing the game mode

On this screen, names of the players can be entered and whether other players are bots or not can be chosen by ticking the box next to them. Then the game starts after clicking the start game button. Or, by clicking the go back button it can be returned to the start screen.



Figure 3.4: New game menu screen.

### 3.5. How to play

There is a diamond symbol next to the player's name which shows that it is his turn. The player needs to roll dice before clicking the end turn button. The resulting dice are shown. The player's icon moves on the map according to their dice. Above is the number of the round is shown. After every player plays its turn once, the round increases. The money of the player can be seen below his name.



Figure 3.5: Gameplay menu screen.

### 3.5.1. Tiles

The player can come to certain tiles.

#### 3.5.1.1. City Tile, Company Tile, Transportation Tile

If the player comes to a city tile, company tile, or a transportation tile a pop-up appears. The player can buy the tile, return back or buy the tile cheaper using mafia favor. If the player buys the tile, it is shown in the tile list on the right side of the screen. If the tile is owned by another player, the current player needs to pay tax.

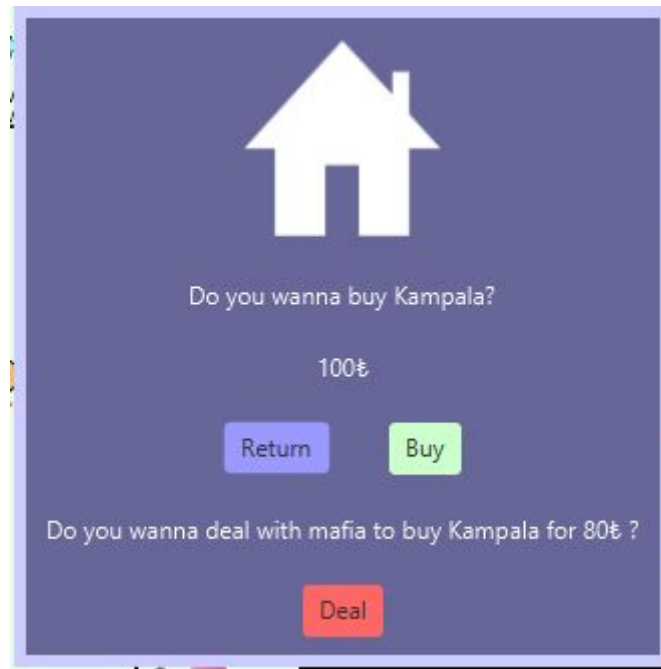


Figure 3.6: Buy tile popup screen.

If the tile is already owned by himself, he can build a house. A pop up appears when the player comes to that tile asking whether he wants to buy a house or not. The hotel button becomes enabled if the requirements are met( 3 house). Also the player can click on the name of the tile in the list on the right side of the screen and open build house pop up again. In that pop up, the player can build or sell houses and hotel. Also he can sell the tile.



Figure 3.7: Buy tile popup screen.

**3.5.1.2. Community Tile, Chance Tile.** If the player comes to a community or chance tile, a pop up appears to show what came out from the deck. The condition in the pop up runs automatically and then the pop up disappears. If a “get out of jail” card comes out, it is added to the list on the right side of the screen.

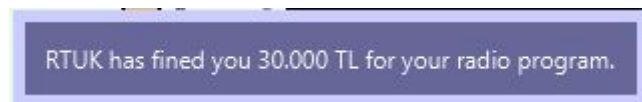


Figure 3.8: Card tile popup screen.

**3.5.1.3. Tax Tiles.** If the player comes to “income tax” or the “luxury tax” tiles, they pay the amount of money stated automatically.



Figure 3.9: Income tax popup screen.

**3.5.1.4. Start Tile.** After passing from the start tile, the player gets 15000 Turkish Liras.

**3.5.1.5. Free Parking Tile, Just Visiting Tile.** If the player comes to either the free parking tile or the just visiting tile, nothing happens.

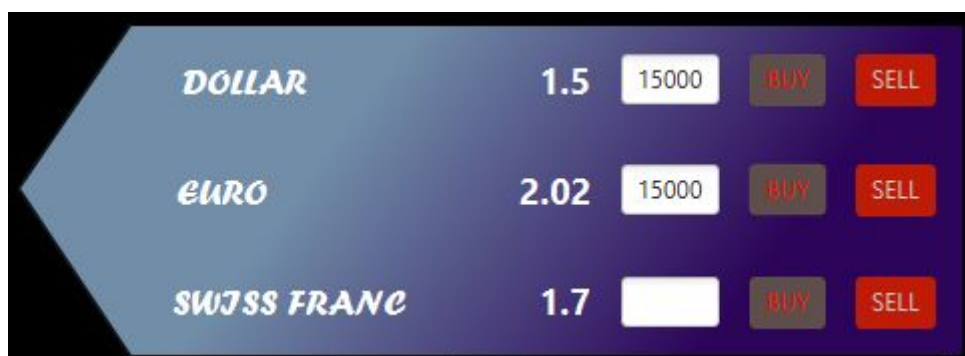
**3.5.1.6. Go to Jail Tile.** If the player comes to the jail tile, the player goes to jail which is the just visiting tile, and stays there until he throws even dice. If he has a “get out of jail” card or if he deals with the mafia, he can also get out of jail.

### **3.5.2. The things that the player can do on their turn**

The player can do certain things other than throwing dice at his turn before clicking the end turn button.

**3.5.2.1. Forex system.** The player can invest in dollars, euros, or Swiss francs.

The main currency in the game is Turkish Liras and the rates next to each currency are rates according to Turkish Liras. The player can buy or sell dollars, euros or swiss franc by entering the amount in the box next to the desired currency. The rates are updated according to selling and buying activities of the players. The amounts they own can be seen in a table below.



The image shows a user interface for a forex trading system. It features a dark blue background with a large light blue arrow pointing left. On the right side, there are three rows of currency information. Each row includes the currency name, its rate, a text input box for the amount, and 'BUY' and 'SELL' buttons.

Currency	Rate	Amount	BUY	SELL
DOLLAR	1.5	15000	BUY	SELL
EURO	2.02	15000	BUY	SELL
SWISS FRANC	1.7		BUY	SELL

Figure 3.10: Forex buy and rate section.



The image shows a table titled 'Player4' representing a player's forex account. The table has three rows, each with a currency label and its corresponding balance.

Player4	
Dollar:	\$30000
Euro:	45000€
Swiss Franc:	CHF 0

Figure 3.11: Forex account table.

**3.5.2.2. Deal with mafia.** The player can deal with mafia for certain favors.

There are 3 options and a close to close the popup.





Figure 3.12: The Mafia deal pop-up.

The first one is the blackmail someone option. After it is clicked, the names of the other players are seen and the player can choose the player who he wants to blackmail. He pays money to the mafia and the mafia takes money from the player he specifies.

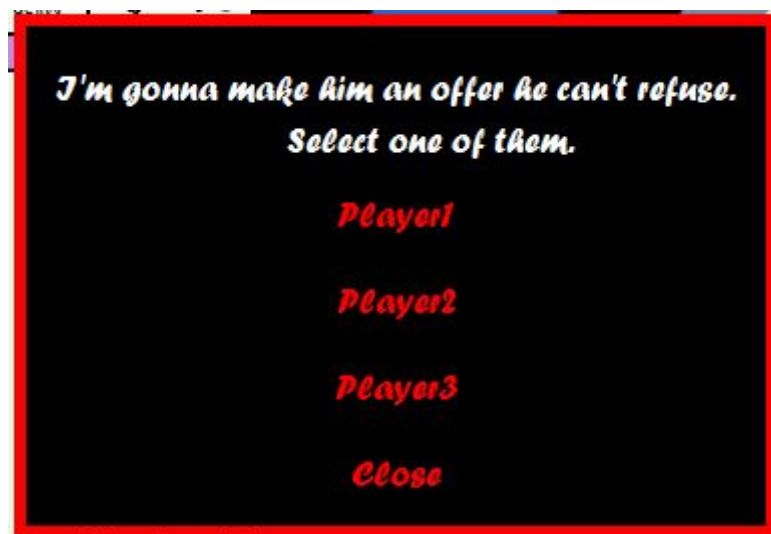


Figure 3.13: The Mafia blackmail pop-up.

The second one is the jailbreak option which lets the player get out of jail by paying money to the mafia. And the third option is to get a chance or community card from the mafia by paying money.

**3.5.2.3. Trade with other players.** The player can deal with the player he chooses by clicking that player. When he clicks on that player a pop up comes up. In that pop up the player can choose the tiles he offers with the money he offers and can choose the tiles he wants from that player with the money he wants from that player.

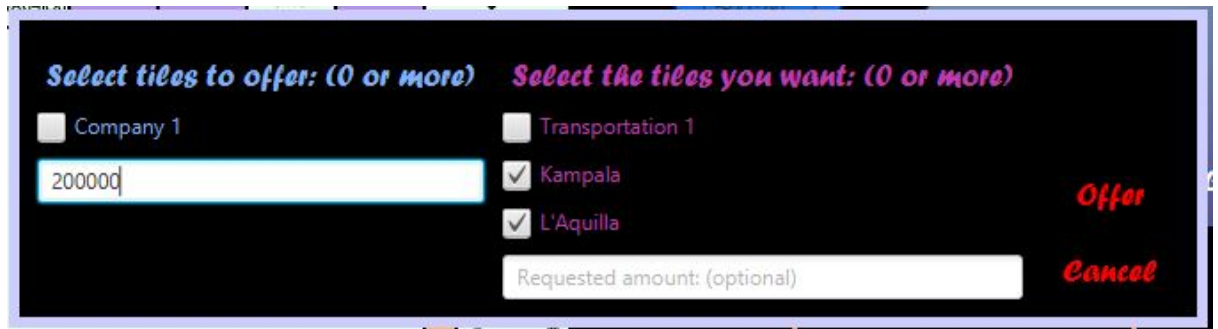


Figure 3.14: The trade with another player pop-up.

**3.5.2.4. Buy a power up.** The player can buy a powerup by clicking the powerup button. A popup which asks the user whether he wants to buy the powerup appears. If buy button is clicked, the powerup is bought and added to the power ups list of the player which is shown on the right side of the screen. The type and specialities of the powerups are randomly drawn.



Figure 3.15: Open a power-up crate pop-up.

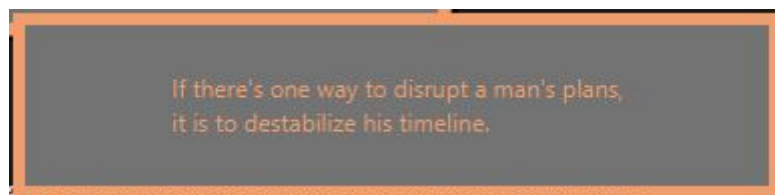


Figure 3.16: Power-up added to the player's inventory.

**3.5.2.5. Use a powerup.** The player can use the pop ups that he owns by clicking on them. He can see the specialities of the powerups after clicking. He can decide not to use it. There are four kinds of power ups. Each powerup category also has different specialities decided randomly.

- **Strike a player power up:** After deciding to use this powerup, the target player who wants to be striked must be chosen in the pop up. The targeted player goes back in the map the number of the tiles stated in the power up.

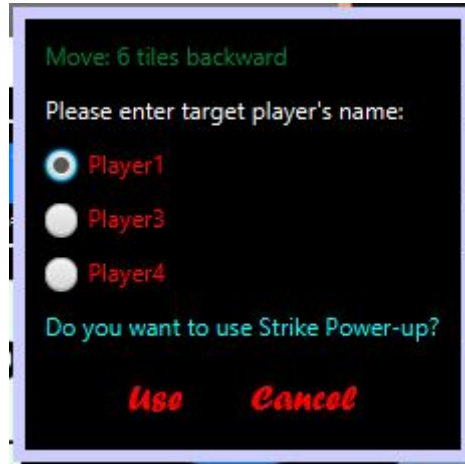


Figure 3.17: Strike a player power-up pop-up.

- **Slow down a player power up:** After deciding to use this powerup, the target player who wants to be slowed down must be chosen in the pop up. The targeted player's dice is multiplied by the factor stated in the powerup for the amount of rounds stated in the powerup. More than one slow downs cannot be applied to the same player at the same time.



Figure 3.18: Slow down a player power-up pop-up.

- **Earning power up:** After deciding to use this powerup, the amount that the player earns from anything in the game is multiplied with the amount specified in the powerup for the amount of rounds specified in the powerup.



Figure 3.19: Multiply earning of yourself power-up pop-up.

- **Forex power up:** After deciding to use this powerup, the player must enter the currency that he wants to manipulate. The specified currency rate is multiplied with the amount specified in the powerup.

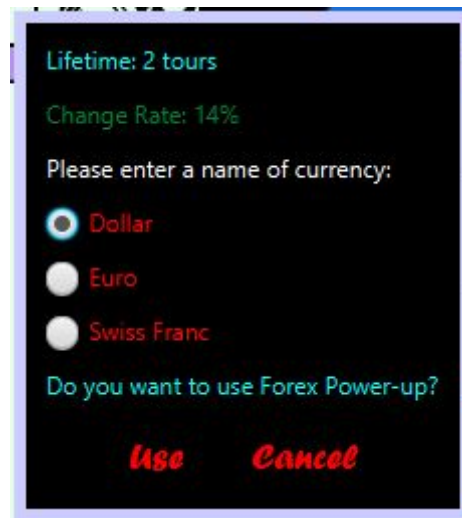


Figure 3.20: Manipulate forex power-up pop-up.

### 3.6. Pause

While playing, the game can be paused and in that menu the player can return back to the main menu or continue the game.



Figure 3.21: Pause menu.

### 3.7. Ending

The game ends with the victory of a player if all the others go bankrupt.



Figure 3.22: Game over pop-up.

#### 4. What is Missing

- Players will not go bankrupt on their own.
- Although the players cannot define the name of the tiles in the map before starting the game, the code foundation is implemented.
- Players cannot specify a custom end money limit.
- Players cannot move again after they rolled a double.
- Players have to wait in the Jail if they cannot roll the same die pair. They can get out of the jail by using a Get Out Of Jail Free card, buying the specific favor from the mafia or rolling a double.. The Mafia also has to roll the dice double in order to get out of the jail.
- Bots do not buy any forex currencies or power-up crates or cards from the Mafia.
- Bots cannot use Get out of jail card on their own, or they do not try to pay Mafia to get them out of the jail. They wait for dice to roll double in order to get out of the jail.
- Trade offering cannot be performed if neither of the players doesn't have any tile.
- Colorblind mode is not %100 effective.

- The narrator feature is left out because we are too shy to voice act.

## 5. Work allocation

- **Asya:**

- Worked on popups and graphics.
- Built the menus and controller logic.

- **Utku:**

- Worked on gameplay mechanics, mostly on turn logic with Yiğit.
- Also worked on the parts for determining turn icons.

- **Ufuk:**

- Worked on gameplay mechanics.
- Built some of the popups.

- **Yiğit:**

- Gameplay mechanics mostly turn logic, worked together with Utku for the most part

- **Oğuz**

- Done the work allocation
- Built some of the GUI

- Built the entities

## **6. Conclusion and Lessons Learnt**

To wrap up, we think that we did a good job. We tried to stick to our design as much as possible and in each case we tried to use the most efficient way to implement things. We also strengthened our Git knowledge by trying to use it on a project. We have used strategy patterns in our class diagram; therefore, implementing those patterns were a good practice for all of us.

Moreover, we learned to work with a group. There were both advantages and disadvantages of it. The advantages were being able to fix each others' problems. If one of us was not able to see a mistake or achieve a certain thing, at least one of us was able to achieve it. Collaboration let us fix our bugs easier and faster. However, the disadvantage was not being able to be aware of others' actions all the time. Time to time, a team member's explanation of a certain code was needed and that wasted valuable time. Moreover, sometimes some members implemented the same part of the code

In conclusion, we put a lot of effort on our project and tried to do our best to complete all of our tasks.



