Individual Software Project - Durak Game

Introduction

The purpose of the project is to create an online game **Durak.** Durak is the most famous Russian game that is well known for many people; it would hardly be an exaggeration to say that most citizens of post Soviet Union countries are familiar with this game. The game itself is very entertaining and strategic at the same time; people like to play it because of different variations and strategies that it has. "**Durak**" means fool. The aim of the game is to get rid of all one's card . The player who is left with cards after everyone else has run out is a loser (fool or durak). I am planning to develop the game that is called "Podkidnoy Durak" which is a classic and most played variation. Other than that, I am planning to develop two more variations and players can choose which one they wish to play. 1) Perevodnoy Durak (transfer fool) refers to the fact that a defender can transfer an attack to the next player by matching the rank of the attacking card. 2) Passport Durak, Durak that involves passports to win.

Game Rules Descriptions

The game Durak is played in different countries in a different way. However, it still preserves the main objectives and rules. The following link describes the "Podkidnoy Durak" very well: https://www.pagat.com/beating/podkidnoy_durak.html. However, it still has a small part that I would love to adjust in my game. The following list of things will explain what I will adjust in the rules from the link given above.

- **Players:** as the game will be developed online, there will not be an option to play the game as a team. In other words, each player will play individually. But numbers are the same, from 2 to 6 players can play.
- **Deal:** since the game developed online, there will not be an option for players to deal the cards. The game as it starts will redistribute the cards to players and put the talon(the central cards) in the middle. Also, if all 6 players are playing then there won't be any talon in the middle. So to determine the trump of the game, the computer randomly will generate the trump. In the game, the computer will be a dealer so there won't be an opportunity to put dealers' last card face up. Also, players won't need to show their lowest trump in the first hand of a session. The game will know who has the lowest trump among the players and will let them attack the player sitting on the left.
- **Attack and Defence:** conditions for the attack described in this section will be implemented with the following change on the second condition (ii. The total number of cards … never exceed six).
  - The total number of cards played by the attacker is unlimited as long as the defender has cards. (There are cases when defender can have more than 6 cards and the attacker)

- In the same section, but for the defender. The defender succeeds in beating off the whole attack if (ii the defender succeeds in beating six attacking cards)
    - The defender succeeds in beating all the cards
- In the online game, before the start, the players can choose:
    - If they want only the neighbours to attack. Here, when the principal attacker(the one who begins the attack) can decide to continue attacking or to Pass. In this case, the next opponent of the defender, will start the attack if he has the cards that were played. Once he is done, he tells that he is Done and the principal attacker can add more if he has any. Once two attackers are done, the bout is done.
    - Every player to attack. It is the same as the neighbor type of attack but involving every player to be an attacker except the defender. If the principle attacker does not have any cards he lets the next attacker on the left to attack and until the defender gives up and takes all the cards or runs out of all the cards or all the attacking players don't have anything to attack with.
- **Drawing from the Talon:** Everything applies in the game except the exchanging the lowest trump with the trump in the talon that is face up.
- **Sequence of Play:** The player, once the cards are dealt, goes first if he/she has the lowest trump in the possession. In case if not trumps possessed by the players, the game decides randomly.
- In my game I am planning to allow the players to cheat. The game is called Fool, so that you can fool other players if they are not paying attention. E.g from the rules in the link, we learned that we can defend ourselves or attack only with cards that are already on the table and attacker can attack if he/she has more of the same rank. But, the attacker can fool and play the card that was not defended by the defender before. The same thing goes for the defender if he/she does not have a card to defend with, can play a different card of a different suit or rank. If other players do not spot it until the next card is played on the table, the wrong card would be allowed. However, if the players spot the cheater it will have the title of a cheater and the player will not be able to cheat anymore. The game will not allow him.

Other than the points noted above, everything stays the same.
As I have mentioned earlier, I am planning to implement the variations as well.

Variation: Perevodnoy Durak - (Transfer fool)
For the details and rules for Perevodnoy Durak: https://www.pagat.com/beating/perevodnoy_durak.html.
However, no **variation** and **pass card** will be implemented in this game.

Variation: Passport Durak

To describe this variation, we need to establish what a round means in this variation.

- One round of the game is considered to be a full game itself that is described in "Podkidnoi Durak".
- In the first round, every player **has** a passport of value 6. That does not mean they physically own the card, but that if they obtain the card of that value during the game in any way, they can use it to upgrade to the next passport.
- The player wins the game only if they manage to upgrade to the passport of value Ace and win a round using that passport.
- The following are the values of passport: 6(starting round), 10, Jack, Queen, King, Ace(final round)
- So, in general, if a player has a card of value X (X being the value of their current passport) they are not allowed to defend or attack using that card. The only exception is if that card is of the suit of the trump card, they can use it to defend themselves. However in this case they might lose their passport if they don't possess more than one card of value X (sometimes it might be worth doing so).
- So in Passport, if you have a passport of value X, you cannot attack with it and you cannot defend unless it is a trump. Passport serves you as a ticket to the next round.
- The ways to obtain the card X is either when dealing or taking the cards from the talon. One more way is if you get attacked by the card of value X. In that case, you are not allowed to defend yourself, but you need to take that card as well as any other that you might have been attacked with previously in the same bout.
- When do we use the passport then? In a simple case you will get attacked and manage to defend the attack successfully, and, by doing so, get rid of any other card in your hand that isn't a passport. In this situation, it is your turn to attack the next player, but since you only have passports left, you simply show them to the other players and by doing so leave the round and pass to the next passport successfully (in case your passport was Ace, you win the overall game and it is over). After this, other players will continue to play the round, until only one player is left. That player cannot transfer to the next passport value, so the next round played he/she will play with the passport of the same value as the previous round.
- What also might happen is that you did not manage to obtain the passport during the round (this is unfortunately mostly based on luck), so, once you get rid of your cards, you stop playing that round, but you will not be able to transfer to the passport of the next value.

How Game Will Be Played:

The program will support multiple games in progress at time. Players will be able to join the game using the url. Once joined they would be in the Menu section where they have a choice:
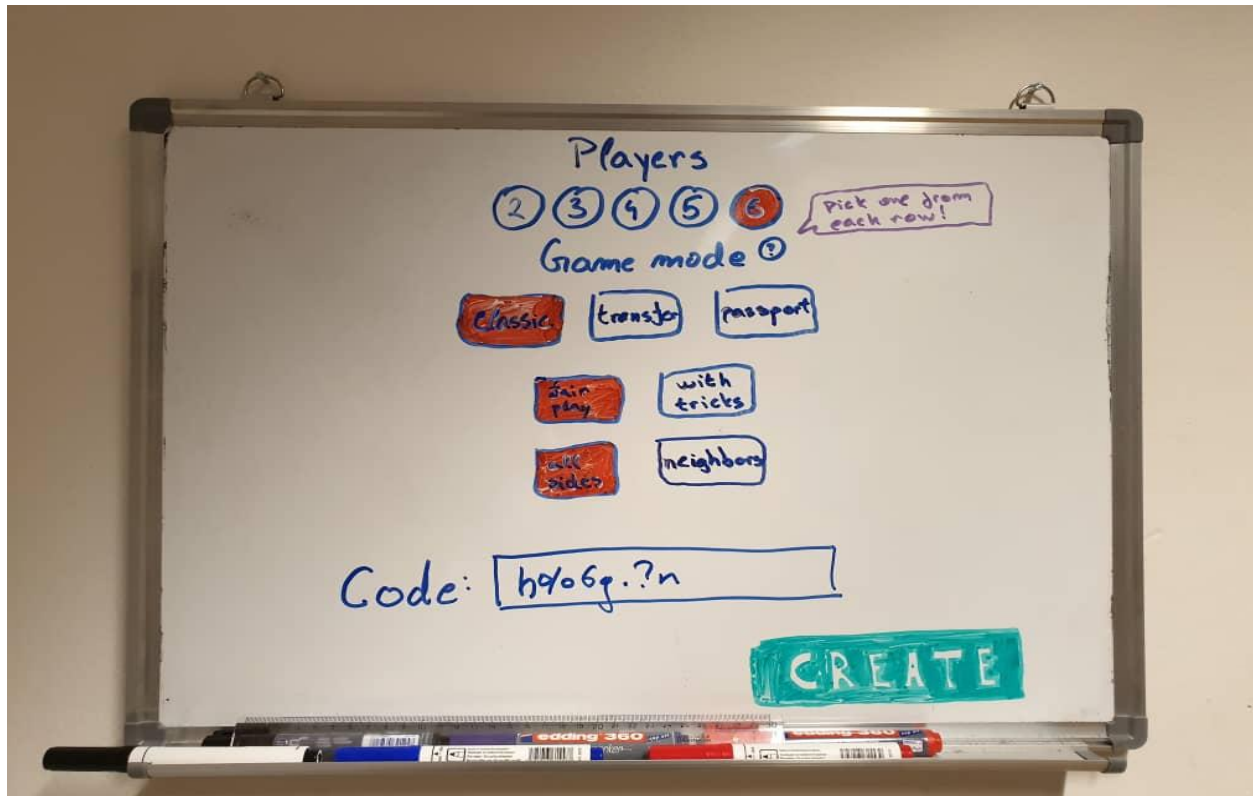
● Create Game
● Join Game
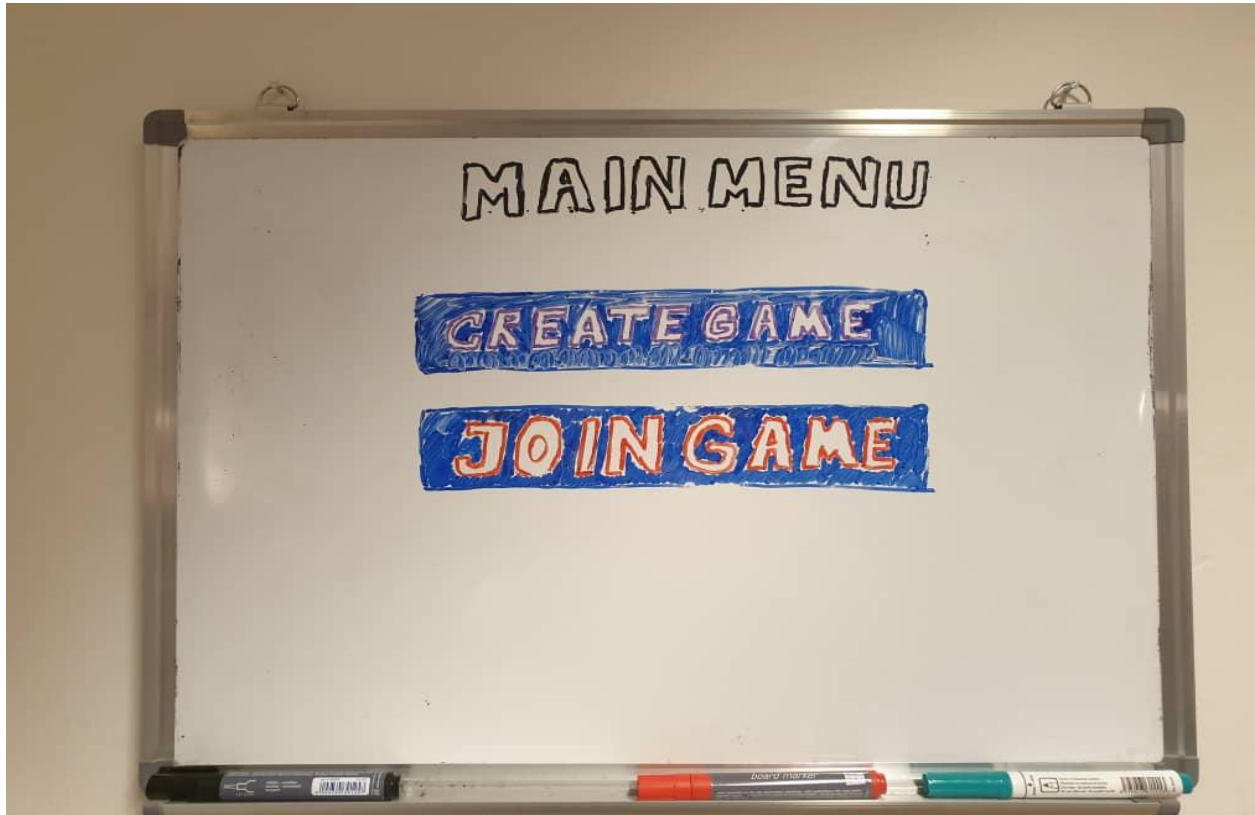
If the player creates the game, they're the host; they set the prefered rules. For example, player can set and choose from the following preferences:

● Choose number of players
● Choose the Game Mode(players has to choose one in each section):
  ○ Variation: Classic, Transfer or Passport
  ○ Fair Play or With Tricks
  ○ All sides or Neighbours attacking
● Unique Code of the game (used for other players to recognize to join)

Every section of the game (except the menu) will have a back button. I forgot to include them in most of the images.

In order to create the game, all the sections must be selected and the code name should be given. Code of the game will be randomly generated. It is a five letter long unique code of the room. If the player wishes they can change it. The program will check if the given password does not exist in the game. Once everything is set, the user has to press the **CREATE** button to create the game. After this, the host of the game will be transferred to the waiting lobby where they will be expecting other players to join.

Waiting lobby will be discussed a little bit later.
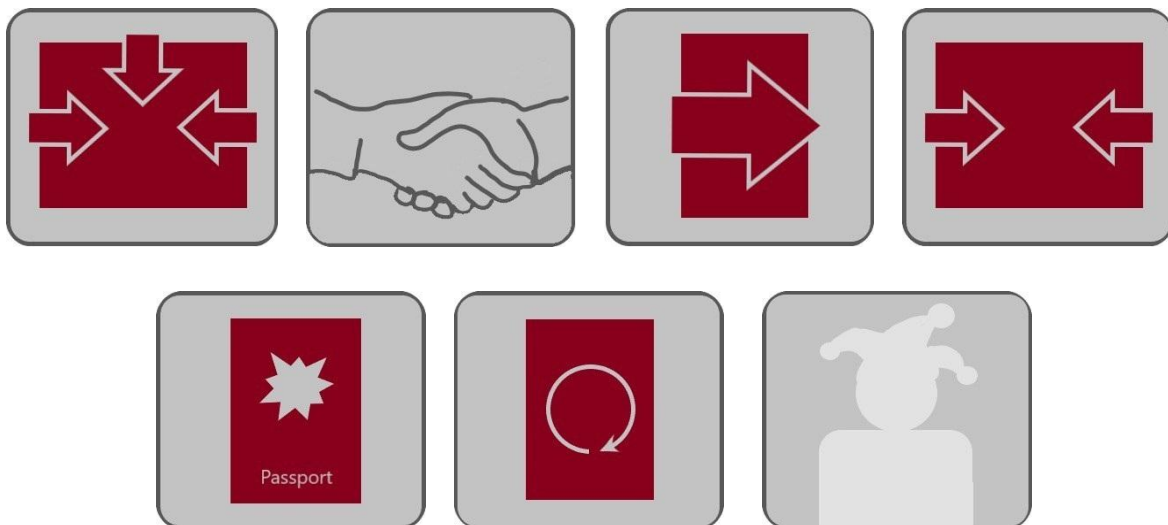
The images above represent the icons for the game modes. Naming from the left to right: 1) All sides attacking 2) Fair play 3) Classic variation 4) Neighbours attacking 5) Passport variation 6) Transfer variation 7) With tricks.

On the other hand, if players want to enjoy the quick game or join the lobby with their friends, they click the Join **Game** button. They will be directed to another window with the list of the games already created. The following image is the rough representation of how the list of games might look on the user's screen.
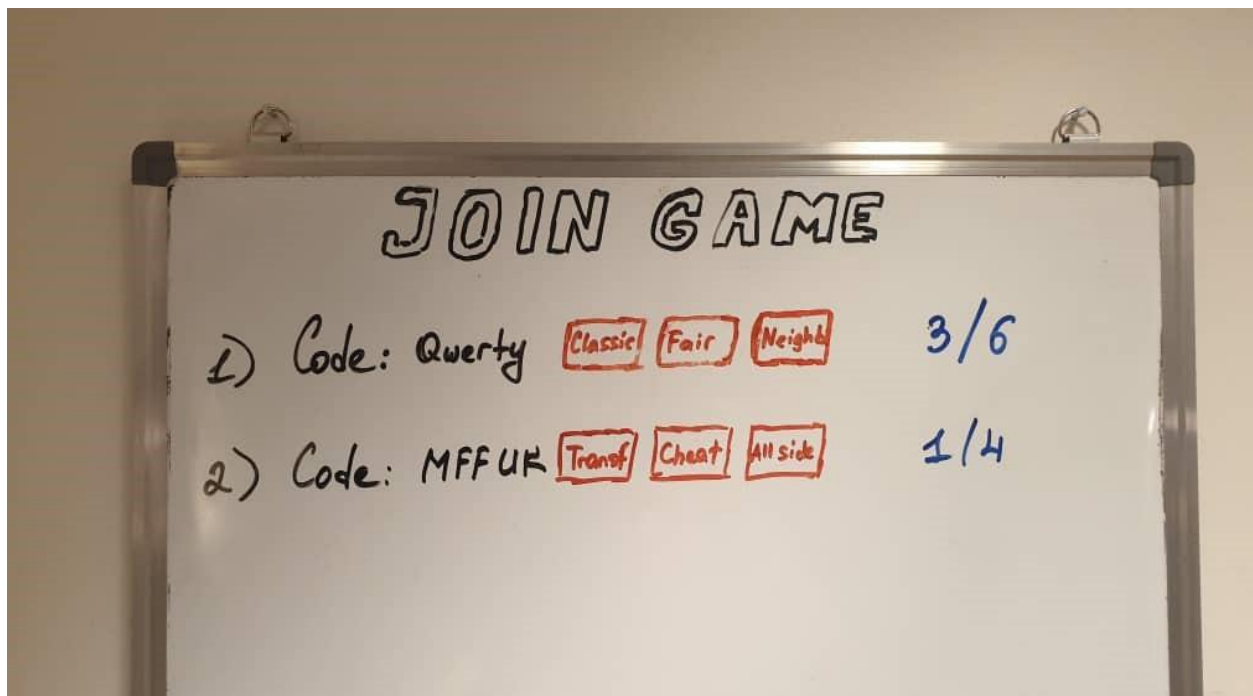

The list of games represents the games that were already created. As you can see, they include: code, preferences and the total number of players that are joined and ready. Players that prefer the following game settings can join the game (the modes will be replaced with icons that are mentioned above).

When the game is created by the host, as I have mentioned before, they will be waiting in the waiting lobby. This is the place where all the players that joined and the host including get prepared for the game. This is the part where the players prepare their profile, in other words, they set their names and icons for the profile.

As you can see in the rough sketch below, a waiting lobby or more like a get ready lobby, will include the number of players joined and the number of players that are already ready. Players that are ready are those who have filled their names and chose the icon for their profile and pressed ready button. Joined players are those that have just entered the lobby and only in the process of preparing their profile.

It is worth mentioning that once the total number of players that are ready and joined equals the maximum capacity set by the host, the game will be removed from the list of games. But if someone leaves from the lobby the game will pop up again on the list.
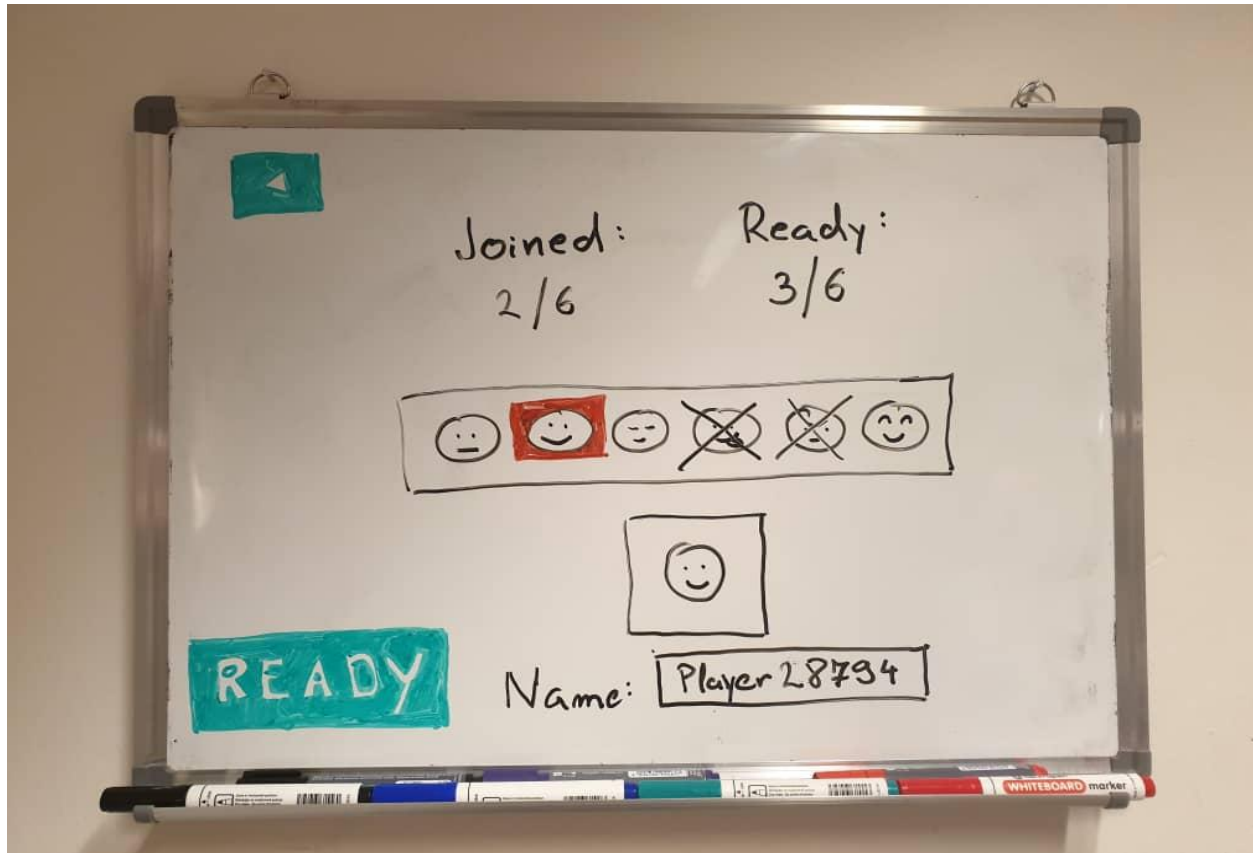
There are in total 6 icons to choose from regardless of how many people will be playing. Once the icon is chosen by a player, other players cannot choose the same one - the icon becomes of a dark color (in other words, players cannot push the icon anymore unless the player leaves the lobby). Therefore, each player gets their own unique icon. These are the icons that will be used in the game:

Additionally, if the player presses the **READY** button without preparing their profile, it will be set automatically. In other words, the name will be default to something like Player1 but the icon will be randomly chosen.

Once all 6(this number depends on the type of the game) players are ready they are moved to the playing room window.

The play room section.

The following image is the representation of the middle game of 6 people.

Players will be placed around the table and will be seated just like in the image above. The order of players seated around the tables is determined by the order the players pressed the **READY** button in the waiting lobby. Once they join, the game will automatically deal the cards to players in the order following the **READY** button. The dealing of the next consecutive rounds will change from the outcome of the round played before. The cards will be dealt from the loser of the previous round. (this applies to a passport variation. **Not classic)**

Each player will have the view represented in the image above: cards placed up, opponents cards placed down, the profile icon and name on it, timer and the text bubble button. Every player will have their icon and name visible for others (in the image they don't have their icon because I forgot to put it but they will have an icon and name they chose).

The timer shows how much time left for the player to perform an attack or defend. Every player will have a minute no matter if it is attacking player's turn or defending. Let's say It is player A's turn to attack in the beginning of the game. The text bubble will indicate "It is your turn" text on the button and

the time starts. **Note that the text "It is your turn" appears only in the first move.** The player will have a minute to place a card, otherwise, the game will consider them disconnected and their cards go to a discarded heap ,and hence, they will be disconnected from the game. After the player makes an attack the timer starts for the defender and the text bubble on the button shows "Take". The player needs to defend or take the cards in a minute, otherwise the game will automatically take the cards for the player and the game continues. If the defender successfully defends, the principal attacker will have the timer started and "Pass" text on the button will appear. If you press it will represent "I do not have any cards to attack with". If the Pass button is pressed the next attacker will have the same scenario. **The timer runs for one person in the game only.**

In the image, you can witness the attacking players having the red colors and the defending player having the green color. This indicates who is currently involved in the bout and therefore will decrease the confusion between the players on who is attacking and who is defending.

On the left side of the screen, there will be a deck of cards left after dealing, in this case there are 6 players and all the cards are dealt so the trump of the card is determined randomly. The trump of the game will be shown just like in the image. Otherwise the trump cards will be placed face up under the remaining cards placed face down. On the right side of the screen, there will be a discarded heap of cards placed face down. Those are the cards that are disregarded after the bout (described in the game description) just like in the image.

When the bout happens between the attacker and defender all the cards are played in the middle of the board. The placement of the card will depend on the number of cards that were attacked. In other words, the box in which the cards will be placed is resizable. During the attack all the players can see the process of the bout, those who are engaged in the bout and those who are not. This is done so that players can see what cards were already played and what cards other players have.

Text bubble will be button that will have text on it depending on the situations of the game: **PASS** (if the attacker does not have any cards to place), **TAKE** (if the defender can't defend with cards) and in the beginning of the game, the button will show **It's your turn** text over the button where the player should press just to confirm.

When the player is out of cards, which means the victory, they can just wait and watch the game or leave the game to the menu. Other players continue playing until one of them is going to lose. Once the game is over, all players that did not leave the game are directed back to the menu section and the playing room is closed.

The game will involve rotating animations of cards in dealing the cards, throwing cards into the discard heap and receiving cards from the talon(the remaining cards on top of the trump that players take to get 6 cards). In places animations will include cards to flip over as well.

Standard 36 deck of cards will be used for the game from https://www.me.uk/cards/ :
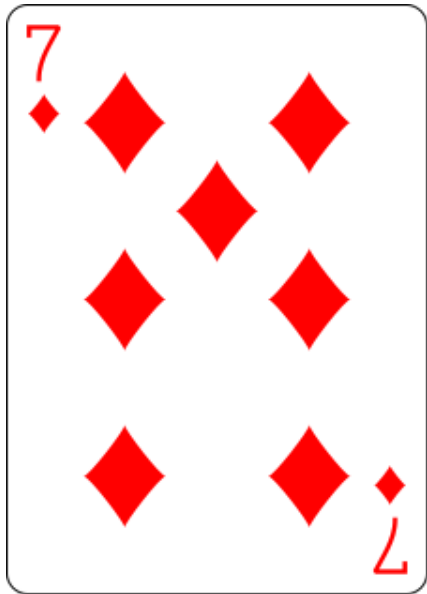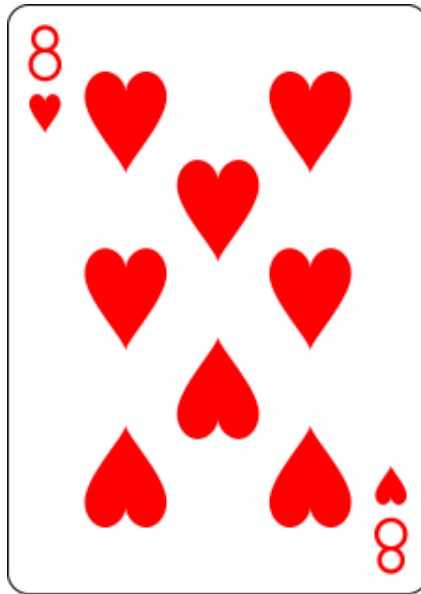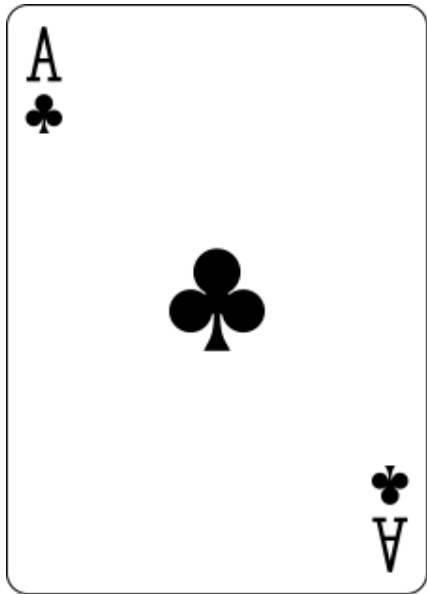
Development

The game will be played online. Therefore, it will be built on server-client architecture. Server will be hosted using ASP.NET Core. The UI of the game will be written using JavaScript, HTML and CSS. The websockets will be used to maintain the duplex communication between the server and the client. The client will run in a web browser. It will support Chrome only. Other than that, ASP.NET Core server will run on Windows and Linux OS.

For the further research purposes, the game will be written using the Model-View Architecture on the server side. The rules and the visuals of the game will be written in different folders so that it will allow to run simulated games between AI.

Important classes that will be involved in the game:
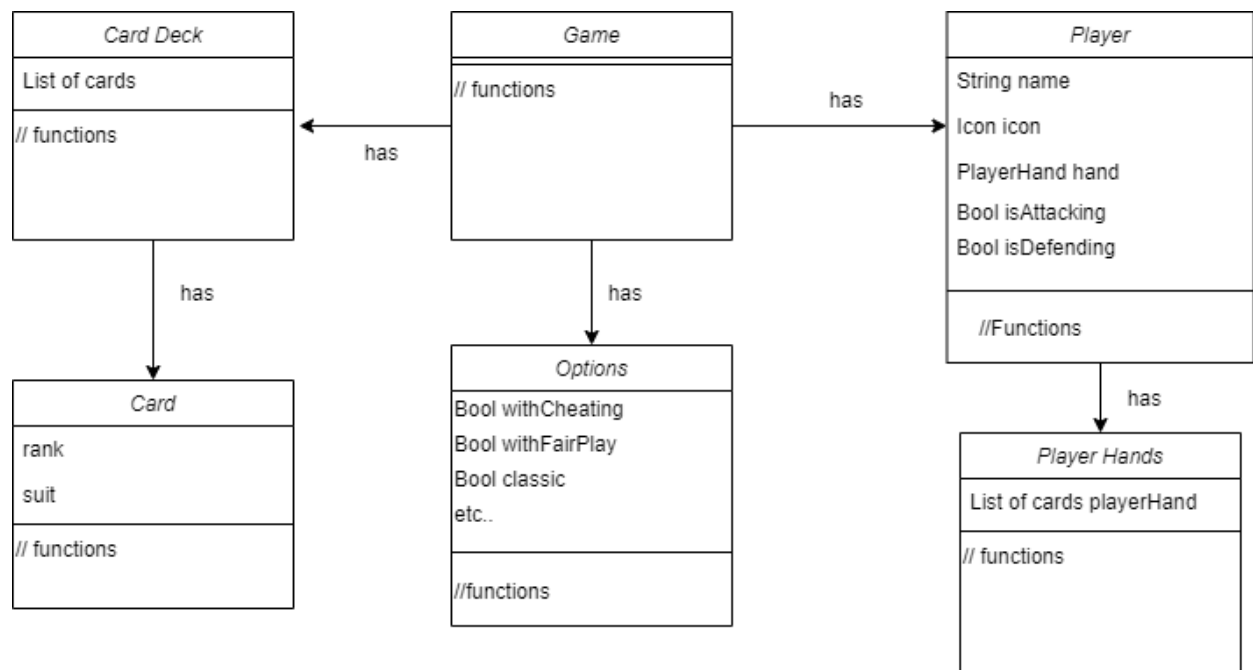
Stages of the Development

1. The players can all connect to the server and they each see an initial screen which only shows one thing: the number of players who have connected so far. As each player connects, the number of players increases dynamically and all screens refresh to show the new number.

2. Now there is a Start button. Any player can push it to begin the game. When it is pushed, all players see a screen showing "Player 1", "Player 2", ... "Player N" at positions around the table.

3. The game now deals cards to all players. Each player sees their cards face up, and all the other players' cards appear face down. The remaining cards appear in a pile face down on the left side of the table. The trump card appears face up at the bottom of the pile. *There is no animation at this stage - the cards just appear.* There is no game play yet - the initial cards just appear, and that's it.

4. Now the basic game is implemented: players can attack each other and defend ; the last player to run out of cards is the Durak. However only one player can attack at a time. There are still no options or variations. (This is a relatively large development step.)

5. Now the game lets two players attack at once, on either side of the defender. The most basic form of the game is now fully functional.

6. Make the players to be equally distributed over the table depending on the number of players in the game.

7. *Add some simple animations to the game. Cards visibly fly from one point to another and can be seen flipping over.*

8. Add the option in which every player can attack. This option appears on the Create Game screen where the players can create the game based on their preference. Also, add next to it the option only neighbours can attack.

9. Create a Menu screen with the Create Game button. When this button is pressed the Create Game screen appears with all the settings in which only classic variation and all side and neighbouring side attacking are functional. Include the CREATE button that will just register this particular game.

10. *Create the Join Game button in the Menu section. When this button is pressed the players are directed to the screen with all the list of games available(that are created).*

11. *Now display all the games that were created in the screen where all the games are displayed.*

12. Create the waiting lobby screen where players get prepared for the game. Show how many players joined the lobby out of N possible players.

13. In the same place, players can enter their names and choose their icons. Create a READY button and display next to the joined number of players, how many players are ready out of N.

14. If the number of READY players is equal to N, the players are moved to the playing room linking to the (3) part described above.

15. *Work on the Cheating option.*

16. Add to the create game settings.

17. *Add a timer: players now have a limited amount of time to make their moves.*

18. Work on the Passport Variation

19. *Work on the Perevodnoy Variation*

Optional Features:
- Perevodnoy Variation
- With Tricks
- Allowing multiple games to play at the same time
- Animation of card flipping and rotating the card while flying from one place to another
- Implementation of timer

Optional features will be resolved at the end, once the main features will be implemented. Because of that some parts of the development stages might change. The changes of putting the optional features to be developed at the end will affect the project a little bit. The main change is allowing only one game run at the time. Therefore, the first person who presses the create button will create the only game and move to the waiting lobby. Other players, on the other hand, do not get the chance to choose from the list of games. They will be directly directed to the waiting lobby once they press the button. Hence, the game will maintain only one game at the time.

However, other features like adding timer and animations will not affect the main program to play a game at least significantly.