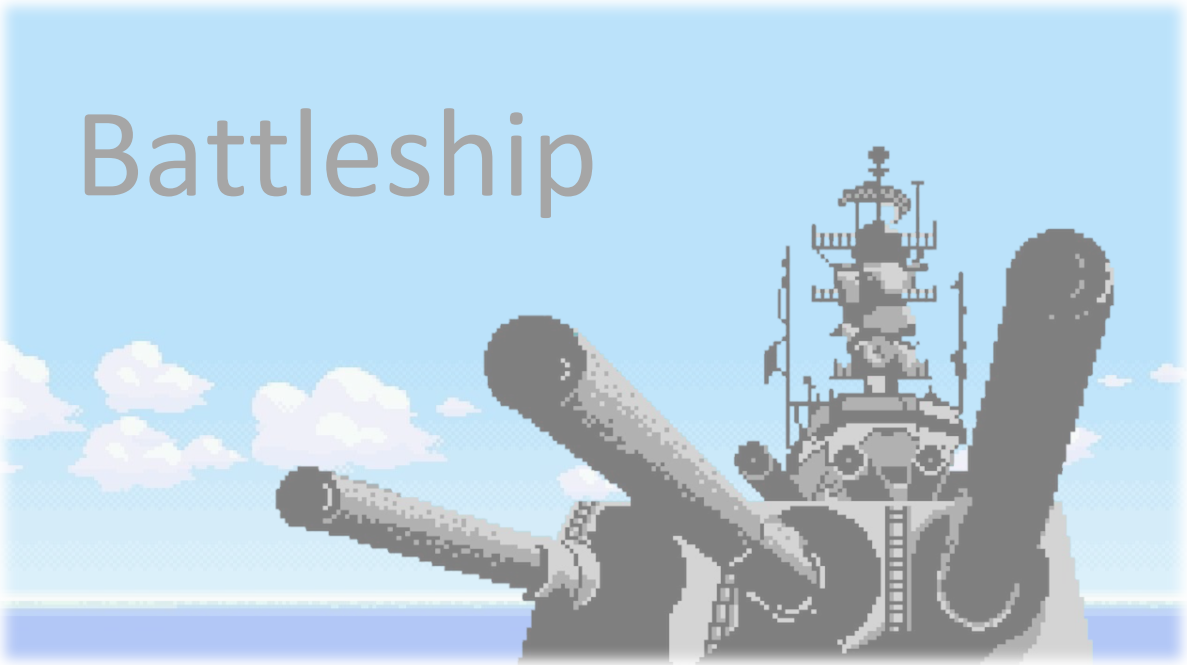

PROJECT REPORT

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submitted to: Dipl.-Ing Robert Ladstätter

submitted by: Team “Die fünf Fragezeichen”

Software Engineering Basics

FH JOANNEUM GRAZ

WS 2017/2018

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1 Description of Project Team

The project team 'Die fünf Fragezeichen' ('?????') consists of the five students Jelmer Jillings, Nadine Neumann, Dominik Pagger, Mathias Pützl and Franz Wachter. The project team is basically divided into two sub- teams. One sub-team is the so called 'Coding Team' (Mathias Pützl & Franz Wachter) which is responsible for all things concerning writing code. The other sub-team is the so called 'Design Team' (Jelmer Jillings, Nadine Neumann, Dominik Pagger), responsible for the design of the game, music and everything concerning project documentation as well as testing the game for any kind of bugs.

2 Game Design

For the overall design of the game, an 8-bit style is used. In more detail, this means that graphics as well as music is in an 8-bit style. The game is a multi-user game, the methodology for that will be described later in this chapter.
After starting the game, a splash screen is displayed. This is a short video that is played for 3 seconds displaying a battleship. A logo of the name of the game (will be decided on later) appears on the screen as well.
The next screen that is displayed is the main menu or welcome screen. On the welcome screen the user has four options. He or she can choose to either start a new game, load an old game, view the high score list (scoreboard) or have a look at the credits.
By clicking 'Credits' the user goes to the credits screen. The credits screen lists all the team members and the work they have done for the project. Sources for media material (pictures, music, sounds) can also be found on this screen. A button allows the user to go back to the main menu/welcome screen.
By clicking 'Load Game' the user is able to reload the last game and continue to play (if the game was already finished, the finish screen is displayed). (If time allows we will try to implement that any saved game can be reloaded and played again).
By clicking 'Scoreboard' the user goes to the high score screen. This board lists all the games that have already happened. It shows the date, the winner of the game, the name of the game, the number of moves needed to win and the option to replay the game. The Replay Screen is only accessible through the high score screen. There the user is able to replay the game that he or she has chosen. The replay screen can be left through the main menu button which leads to the main menu/welcome screen.
By clicking 'Start New Game' a new game will be started. (Behind the scenes a name of the game will be generated at random and displayed when the game starts.) First the user goes to the new game screen. Since it is a multi-player game both players have to put in their names. The name can be chosen by each player, but is restricted to ten characters. The players are also able to enter the amount of ships they want to place on the battlefield. There are three options: they can choose between battleships, cruiser and submarines. It is not obligatory to place all the options of different ships but at least one has to be placed on the battlefield. By clicking the confirm button, the edit screen is opened. First player 1 places his or her ships on the battlefield. Then, after hitting the confirm button, the same edit screen will appear but this time for player 2 (so the multi-player modus is achieved by alternating player 1 and 2). The placement of the ships is done the following way: there are the three buttons 'Battleships', 'Cruiser' and 'Submarines', which the player has to press and according to the

pressed button this ship is then to be placed on the battlefield. The direction of the ship is chosen by the cross button. After pressing the confirm button it's player 2's turn.
After both players have placed their ships, the game itself is started. The multi-player modus is again achieved by alternating the two players. First, player 1 clicks on the battlefield and either misses or hits a ship. Then player 1 has to click the next player button and it is player 2's turn (whenever a whole ship is destroyed, this will be displayed in the statistics box). At any given point in the game, the game can be saved by clicking the 'Save Game' button.
When one of the two players has hit all the other players ships the finish screen will appear. This screen will state the player who has won the game. From here, the main menu/welcome screen can be accessed through the 'Main Menu' button. Behind the scenes there is a function which writes the result in a text file and sorts it. This file is used by the high score screen. There a function displays the scoreboard and reads from that text file.

3 Time Estimation

Table 1: 1 - 'Design Team', 2 - 'Coding Team' for the column ,Responsible sub-team

Work Package	Estimated Time [h]	Responsible sub-team
Designing the logo for splash screen	1	1
Creating a video for splash screen	2	1
Music for splash screen	0.5	1
Research implementation for splash screen	1	2
Creating buttons for welcome screen	1	1
Implementation of buttons for welcome screen	28	2
Design of graphical interface for welcome screen	2	1

Sound effects for welcome screen	1	1
Writing of the text for the credits screen	0.5	1
Implementation of button to go back to the welcome screen for credits screen	1	2
Creating button to go back to the welcome screen	1	1
Design of graphical interface for credits screen	2	1
Sound effects for credits screen	0.5	1
Implementation of code for edit screen	10	2
Creating buttons for edit screen	1	1
Implementation of buttons for edit screen	1.5	2
Design of graphical interface for edit screen	4	1
Sound effects for edit screen	0.5	1
Implementation for starting a game	10	2
Naming scheme for starting a game	1	2

Implementation of buttons for game screen	2	2
Sound effects for game screen	1	1
Design of graphical interface for game screen	4	1
Creating buttons for game screen	0.5	1
Creating statistics box	1	1
Implementation of statistics box	2	2
Sound effects for end of game screen	1	1
Designing of graphical interface for end of game screen	1	1
Implementation of announcing winner	0.5	2
Implementation of function for automatic save	2	2
Implementation of sorting function (for high score)	4	2
Creating button to get back to high score screen	0.5	1
Implement a replay slider	8	2

Sound effects for replay screen	0.5	1
Design of graphical interface for high score screen	2	1
Sound effects for high screen score	0.5	1
Creating button (back to welcome screen) for high screen score	1	2
Implementation of button for high screen score	1	2
Implementation of a function to display high score screen	2	2
Fixing bugs	30	2
Project documentation	13	1
Preparing project presentation	5	1

4 Project Cost Calculation

The costs for this project include personnel costs, material costs and equipment costs. Equipment (computers, electricity, …) was provided by the FH Joanneum, so it was free of charge. The project planning software (Trello) was also free. Material costs comprised of costs for pens and paper used for taking notes. Personnel costs are calculated according to the time estimation of the project. The whole project has an estimated time of 142 h. An average hourly wage for a software developer is approximately between 55 and 72 € per hour.

Cost Calculation:

Personnel Costs: 142 h x 55€ => 7810€
Material Costs: 10 €
Equipment Costs: for free

This comes to a total budget of 7820 €, that would be needed to complete this project.

5 Planned Work Items

5.1 Splash Screen

5.1.1 Designing the logo for the splash screen

Since the splash screen will display the name of the game a logo of the name will be designed.

5.1.2 Creating a video for the splash screen

The splash screen will be displayed for about three seconds. For that, a short video will be played that has to be created.

5.1.3 Music for the splash screen

A short piece of music will be played and this has to be searched for and edited to fit the length of the video as well as attached to the interface.

5.1.4 Research implementation for splash screen

The 'Coding Team' will be responsible for researching the implementation of a splash screen to add it to the programme.

5.2 Welcome Screen

5.2.1 Creating buttons for welcome screen

On the welcome screen four buttons will be displayed. These four buttons will be created using SceneBuilder. The buttons will be designed with the help of CSS.

5.2.2 Implementation of buttons for welcome screen

The functions behind the four buttons (load, credits, high score, new game) on the welcome screen will be written and the code will be attached to the interface.

5.2.3 Design of graphical interface for welcome screen

The background image for the welcome screen will be designed using the SceneBuilder as well as CSS.

5.2.4 Sound effects for welcome screen

There will be several sound effects on the welcome screen. There will play background music when the user is on the welcome screen. Further, there will

be a sound effect when you press a button. The music and sound effects will be searched for, edited and attached to the interface.

5.3 Credits Screen

5.3.1 Writing of the text for the credits screen

A text will be written that states the team members and what tasks they were responsible for during the project. This text will be displayed in a text field on the credits score which will be created using SceneBuilder.

5.3.2 Implementation of button to go back to the welcome screen for credits screen

The function (code) behind the button to go back to the welcome screen will be written and attached to the interface of the credits screen.

5.3.3 Creating button to go back to the welcome screen

A button will be created that allows the user to go back to the welcome screen. This button will be created using SceneBuilder and designed with CSS.

5.3.4 Design of graphical interface for credits screen

The background image for the graphical interface will be designed using CSS. Further, a text field will be added to hold the text for the credits.

5.3.5 Sound effects for credits screen

Background music will be played while the user is on the credits screen, which has to be searched for, edited and attached to the interface. Further, a sound effect for the 'go back to the welcome screen' button will be attached to the interface.

5.4 Edit Screen (also New Game Screen)

5.4.1 Implementation of code for edit screen

On the edit screen players can choose their fleet and place it on the battlefield. For that code will be written and attached to the interface.

5.4.2 Creating buttons for edit screen

A confirm button will be created using SceneBuilder. Another button to choose which ships are placed on the battlefield will be created using SceneBuilder as well. Labels will be created to put in names for player 1, player 2 and the amount of ships the players want to place on the battleship. All the buttons will be designed using CSS.

5.4.3 Implementation of buttons for edit screen

In order for a second player to choose his/her fleet the code for the next player button will be written and attached to the interface.

5.4.4 Design of graphical interface for edit screen

The background image for the graphical interface will be designed using CSS. Further, the battlefield will be created using SceneBuilder

5.4.5 Sound effects for edit screen

A background music will be played while the players place their ship, which has to be searched for and edited. Sound effects include sounds when pressing buttons as well as a sound when part of a ship is placed on the battlefield. These will have to be searched for, edited and attached to the interface.

5.5 Start Game

5.5.1 Implementation for starting a game

Code will be written to start a game after both players have placed their ships and pressed the confirm button.

5.5.2 Naming scheme for starting a game

For the naming scheme, it will be necessary to collect possible name combinations. Further, a function (code) has to be written that randomly creates a name for the game.

5.6 Game Flow (Game Screen)

5.6.1 Implementation of buttons for game screen

To save the game at any given point in the game a save button will be implemented, so the code will be written and attached to the interface. The same goes for the next player button to switch between players.

5.6.2 Sound effects for game screen

A background music will be played during the game, which will be searched for, edited and attached to the interface. Sounds for hitting a ship (explosion) and hitting water (splashing sound) will be searched for, edited and attached to the interface as well.

5.6.3 Design of graphical interface for game screen

The battlefield for the game will be created using SceneBuilder. The design of the game screen will be done with CSS. A statistics box will be created which is also part of the graphical interface, for a more detailed description see 4.6.4 and 4.6.5.

5.6.4 Creating buttons for game screen

Two buttons (save game and next player) will be created for the game screen using SceneBuilder. The design will be done with CSS.

5.6.5 Creating statistics box

The statistics box will be created using SceneBuilder, either by using three labels or a text field. A design will be added with the help of CSS.

5.6.6 Implementation of statistics box

A function (code) will be written that adds the already hit ships to the statistics box and will be attached to the interface.

5.6.7 Designing screen for end of game

5.6.7.1 Sound effects for end of game screen

Celebration music will be played after one player has won the game. This music has to be searched for, edited and attached to the interface. Additionally, a voice will announce the winner. This will be recorded by one of the project team members and edited and attached to the interface.

5.6.7.2 Designing of graphical interface for end of game screen

A background for the end of game screen will be designed and attached to the interface. A text field will be added using SceneBuilder that will hold the winner of the game.

5.6.7.3 Implementation of announcing winner

A function (code) will be written to announce the winner of the game and attached to the interface (text field).

5.6.7.4 Implementation of function for automatic save

A function (code) will be created that assures automatic saving of the end result of the game and attached to the interface.

5.6.8 Implementation of sorting function (for high score)

A function (code) will be written that adds the end result into a list and sorts it.

5.7 Replay Screen (optional)

5.7.1 Creating button to get back to high score screen

A button will be created using SceneBuilder to get back to the high score screen. It will be designed using CSS.

5.7.2 Implement a replay slider

The code for the replay slider will be created and attached to the interface. A slider will be created using SceneBuilder.

5.7.3 Sound effects for replay screen

A background music will be played while players are on the replay screen. This music will be searched for and edited as well as attached to the interface. A sound effect for pressing the button to get back to the high score screen will be searched for and attached to the interface.

5.8 High Score Screen

5.8.1 Design of graphical interface for high score screen

The background image for the high score screen will be designed using CSS. Further, to display the high score list, a text field to hold the list will be created using SceneBuilder.

5.8.2 Sound effects for high screen score

A background music will be played while players are on the replay screen. This music will be searched for and edited as well as attached to the interface. A sound effect for pressing the button to get back to the welcome screen will be searched for and attached to the interface.

5.8.3 Creating button (back to welcome screen) for high screen score

A button to get back to the welcome screen will be created using SceneBuilder and designed with the help of CSS.

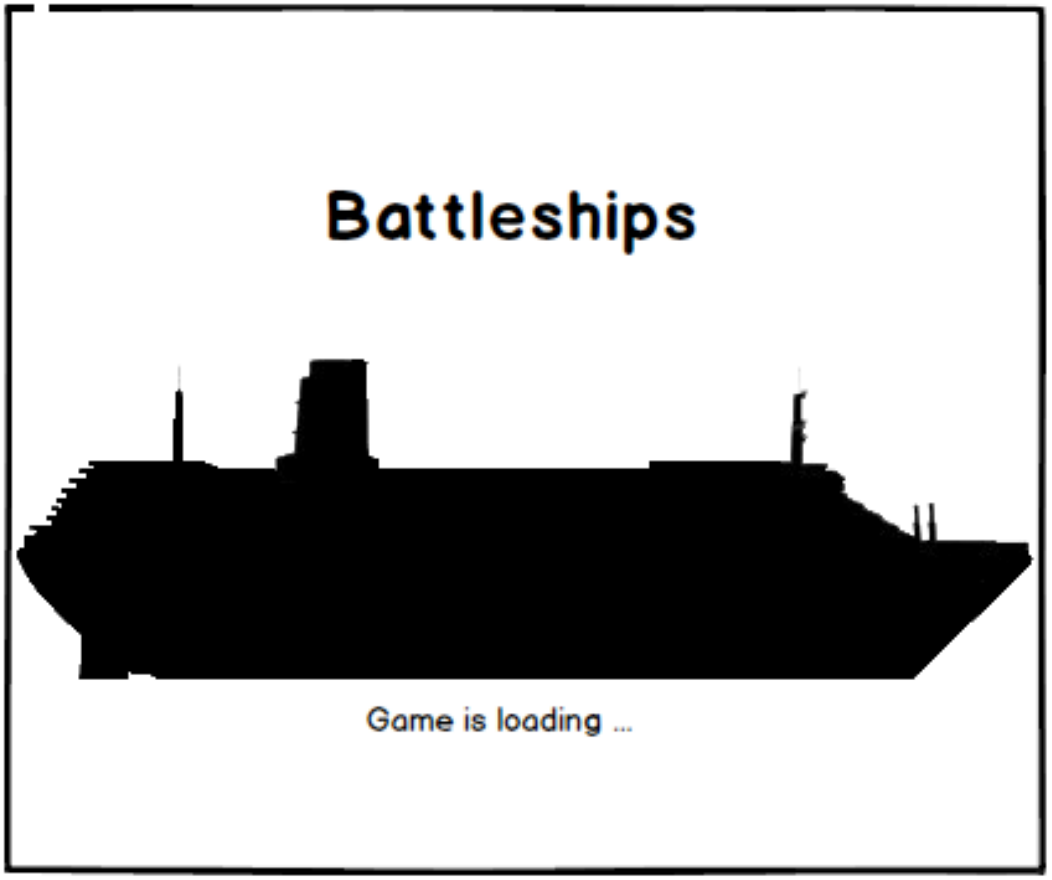
5.8.4 Implementation of button for high score screen

In order to get back to the welcome screen, the code to achieve that will be written and attached to the interface.

5.8.5 Implementation of a function to display high score screen

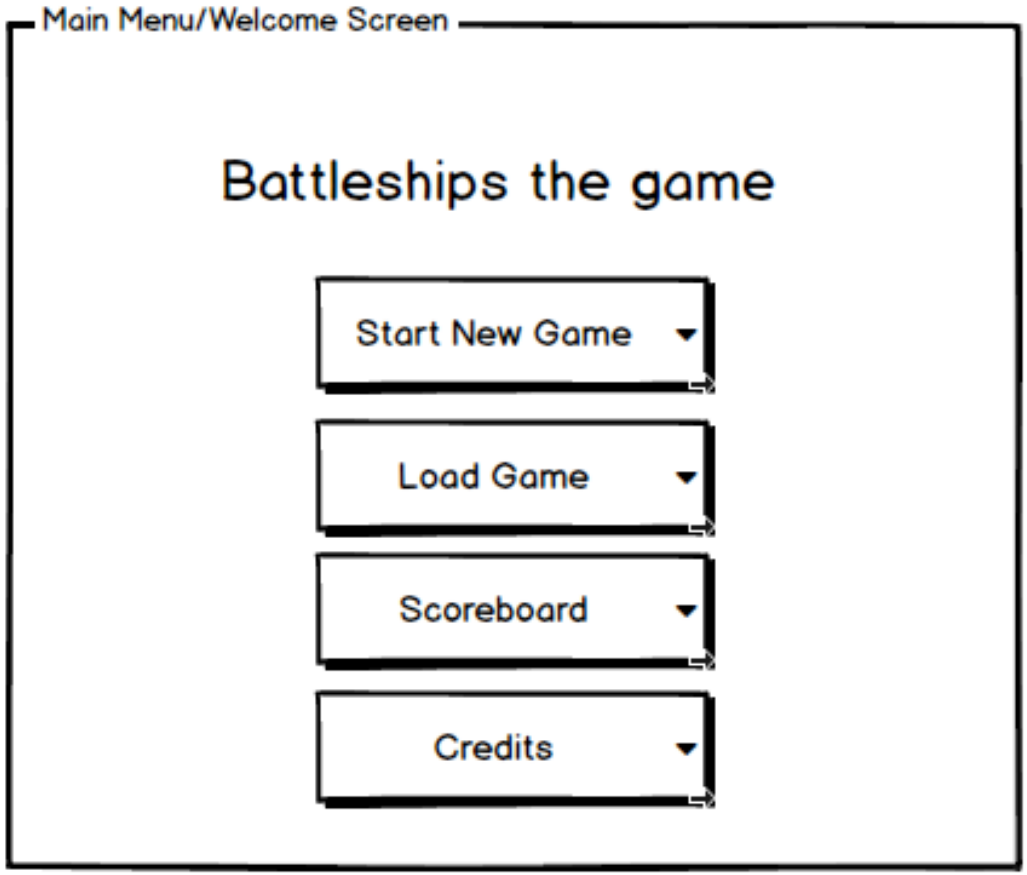
A function (code) will be written that displays the high score after reading all the entries from a text file.

Splash Screen



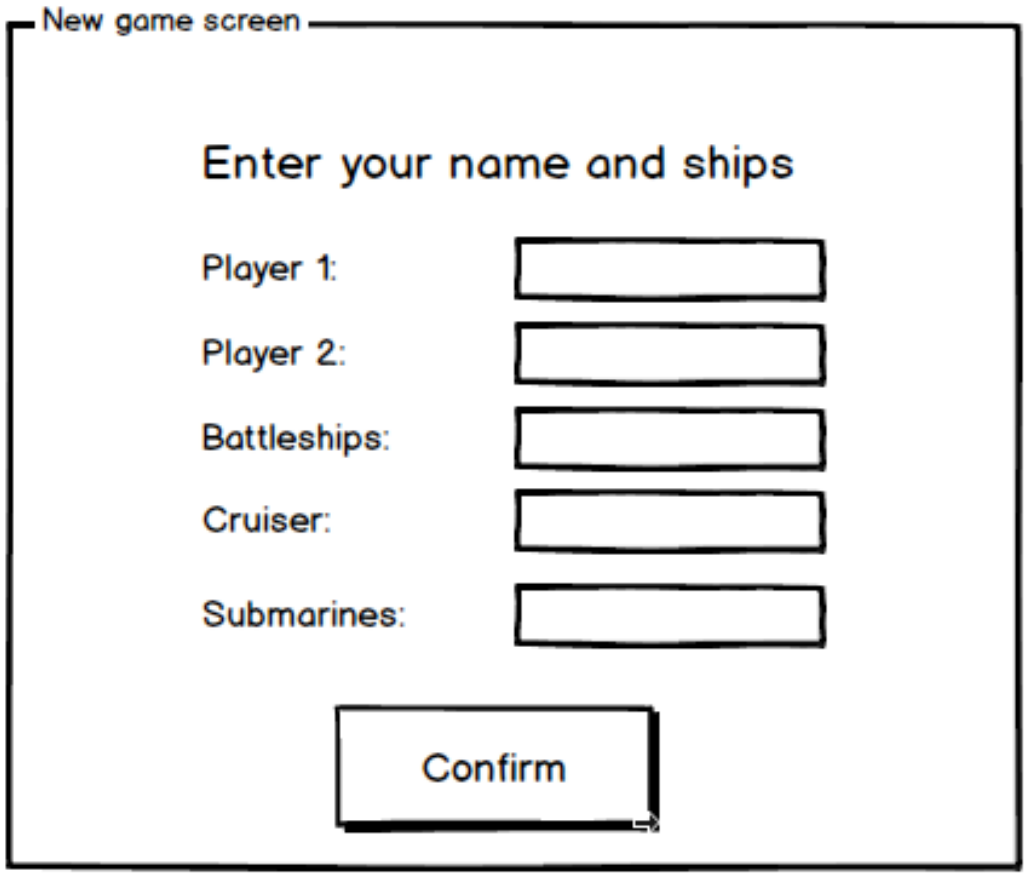
The first screen is the splash screen, which is displayed for a few seconds until the game starts.

Main menu



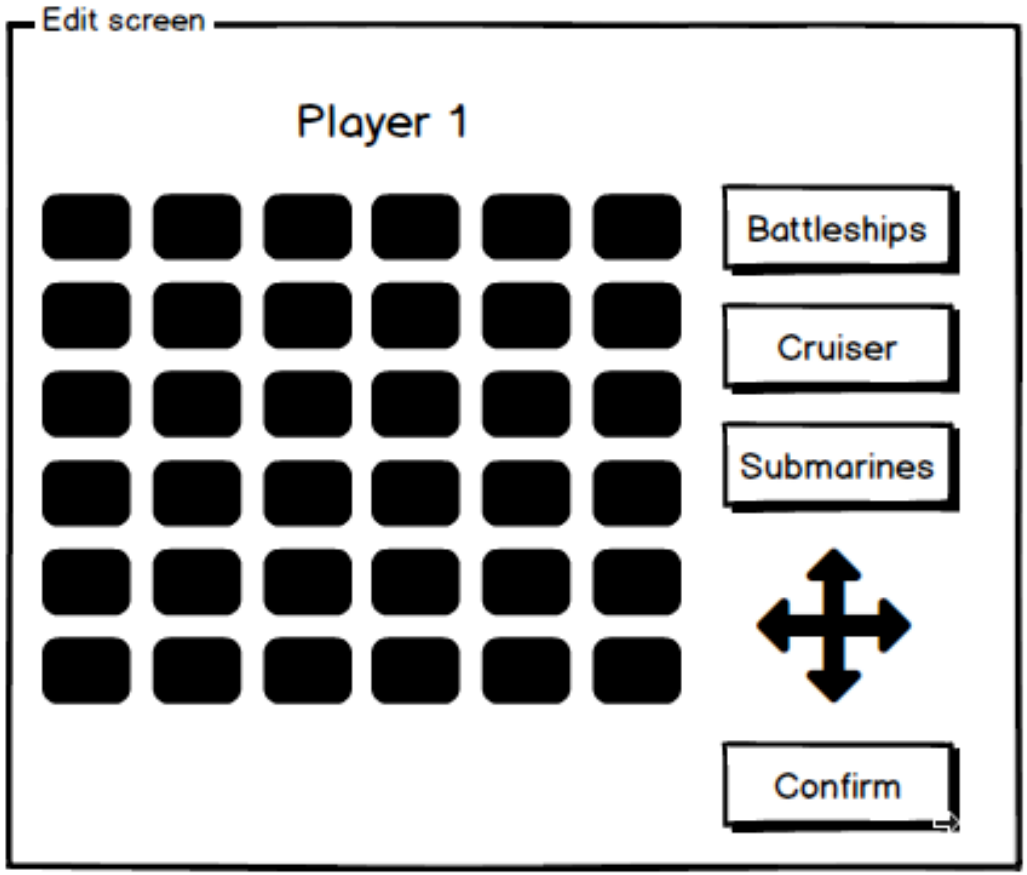
On the 'Main Menu Screen' you can either choose to start a new game ('Start new Game'), load a previous game ('Load Game'), go to the high score screen ('Scoreboard') or go to the credits screen ('Credits) by clicking one of the four buttons.

Start new game



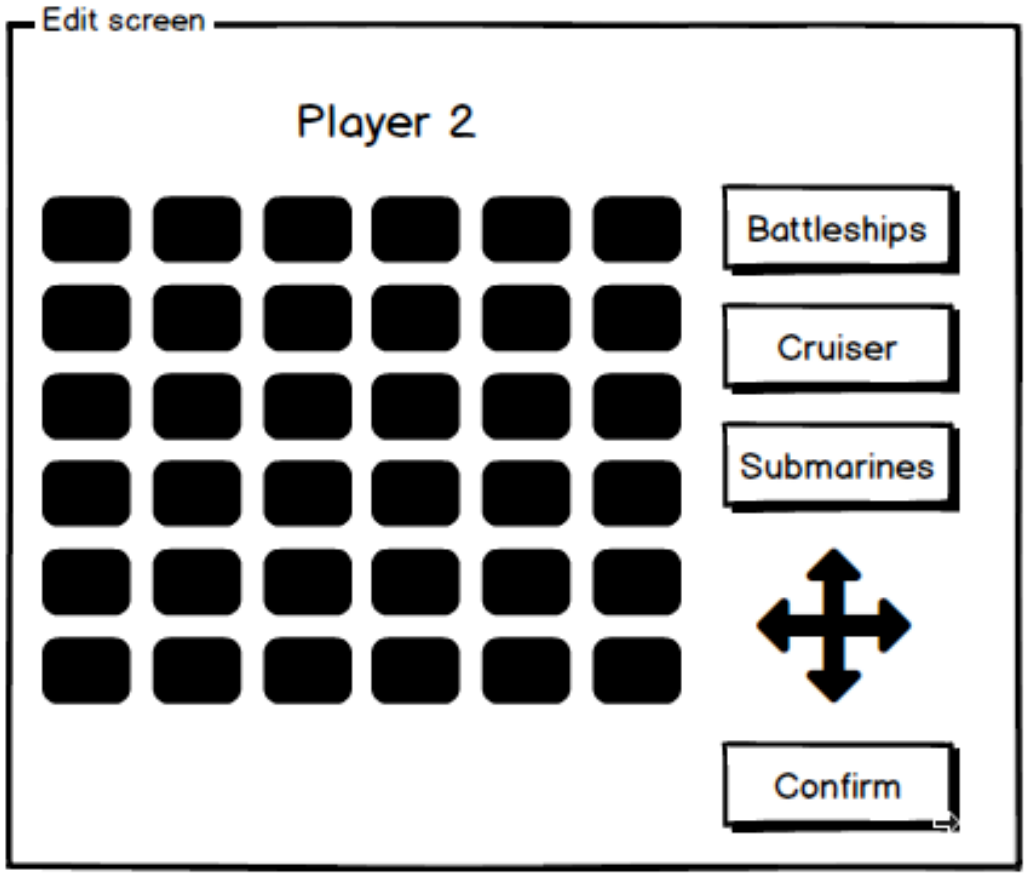
When you are at the 'New Game Screen' you have to choose the names of the two players as well as choose your fleet. You are allowed to choose the amount of battleships, cruisers and submarines as long as the ships fit on the battlefield.

Edit Player 1



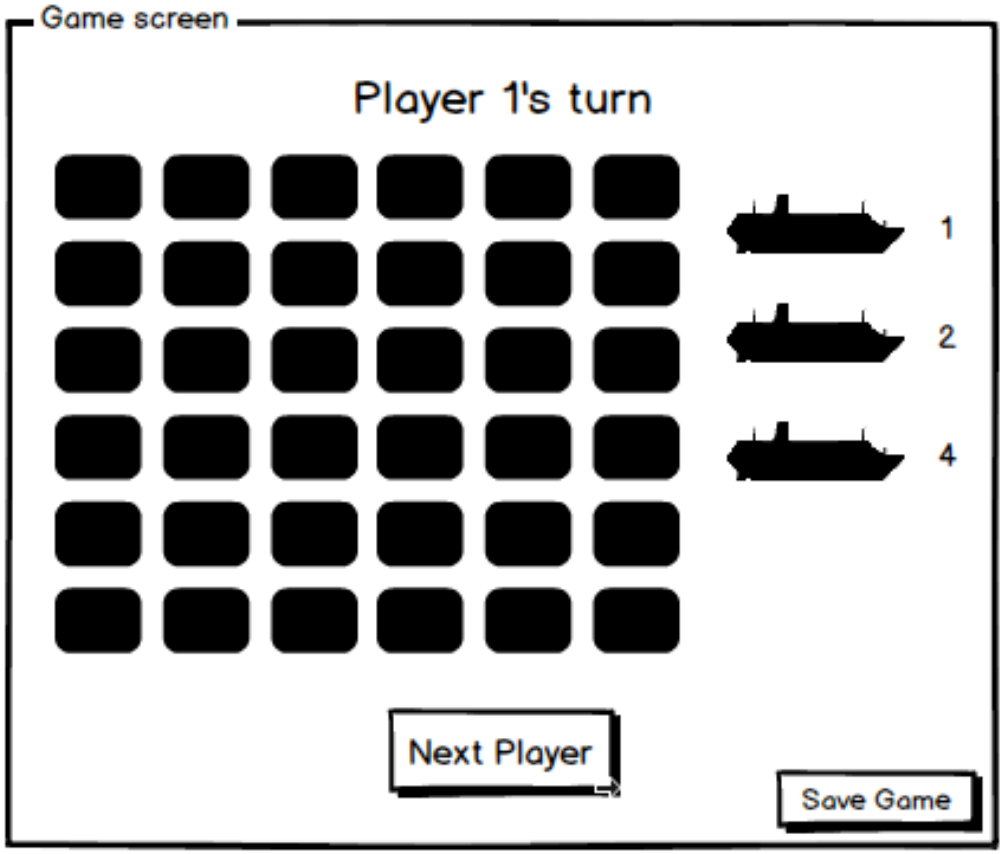
Edit screen of Player 1: Player 1 sets all his ships on the battlefield. By clicking on one of the three options, the ships are placed on the battelfield.

Edit Player 2



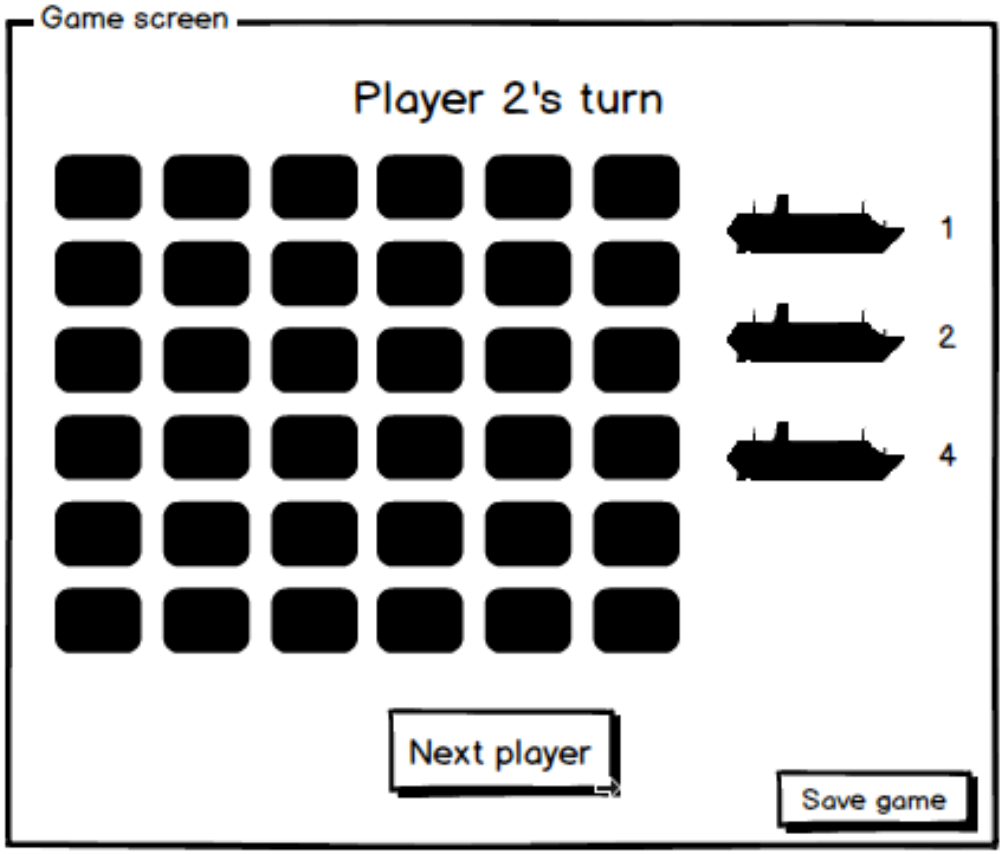
Edit screen of Player 2: Player 2 sets all his ships on the battlefield. By clicking on one of the three options, the ships are placed on the battelfield.

Game



The game has begun and Player 1 clicks on one of the fields, either hitting water or a part of a ship. If a ship is hit completely, the statistic box on the right will show that. To switch to the next player use the 'Next Player' button. It is possible to save the game at every point in the game, just click the 'Save Game' button.

Game2

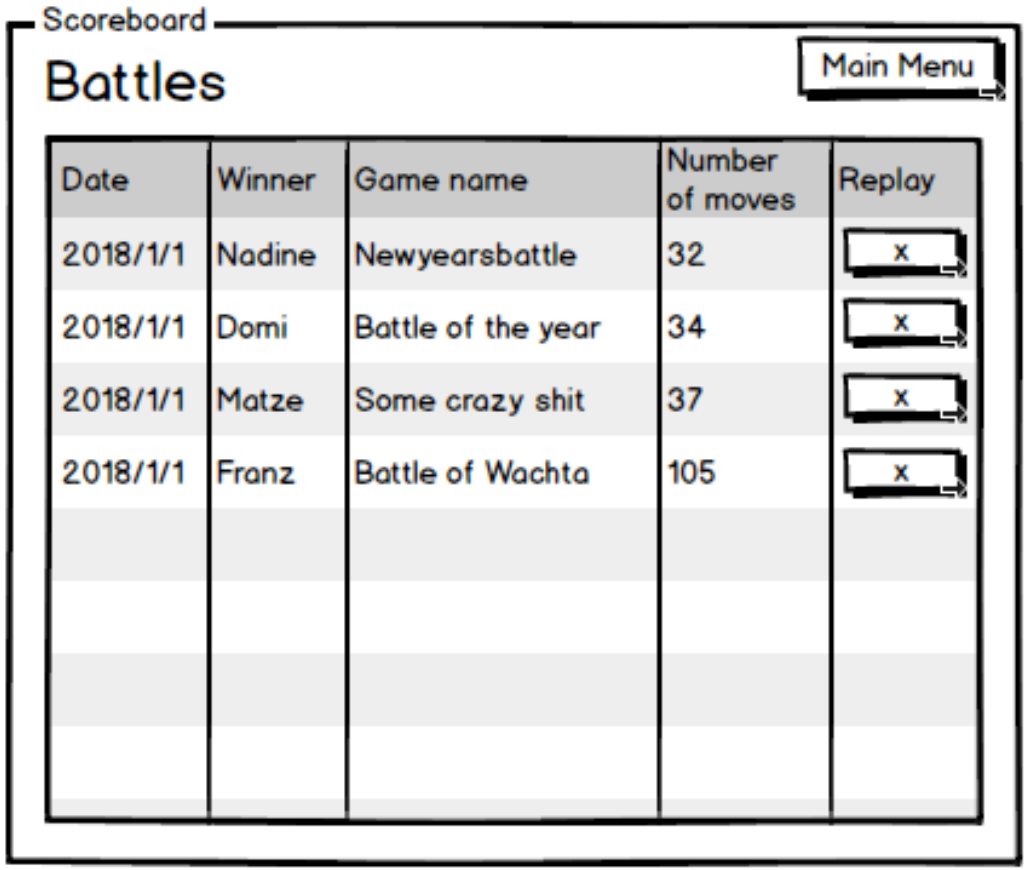


It's Player 2's turn, who also clicks on one of the fields, either hitting water or a part of a ship. If a ship is hit completely, the statistic box on the right will show that. To switch to the next player use the 'Next Player' button. It is possible to save the game at every point in the game, just click the 'Save Game' button.

Finish

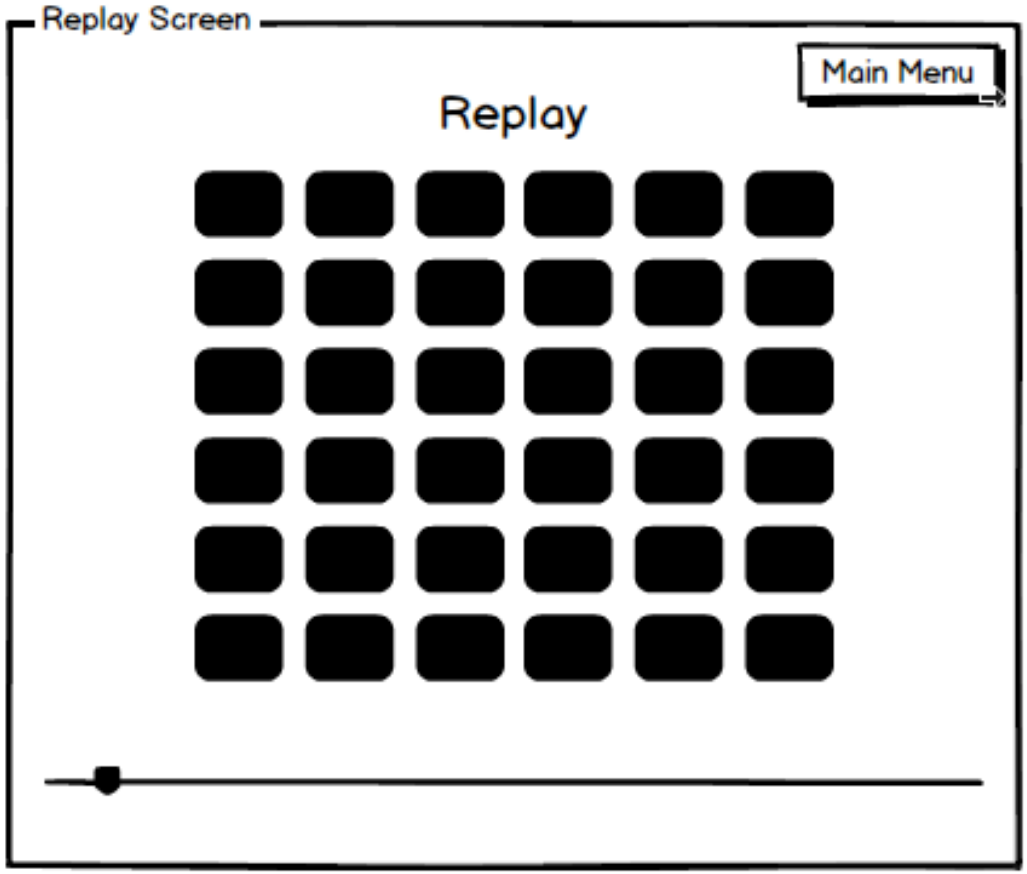
When one of the two players has won, the 'End of Game Screen' will appear, declaring who is the winner. It is possible to go back to the welcome screen by pressing the 'Main Menu' button.

High Score Screen



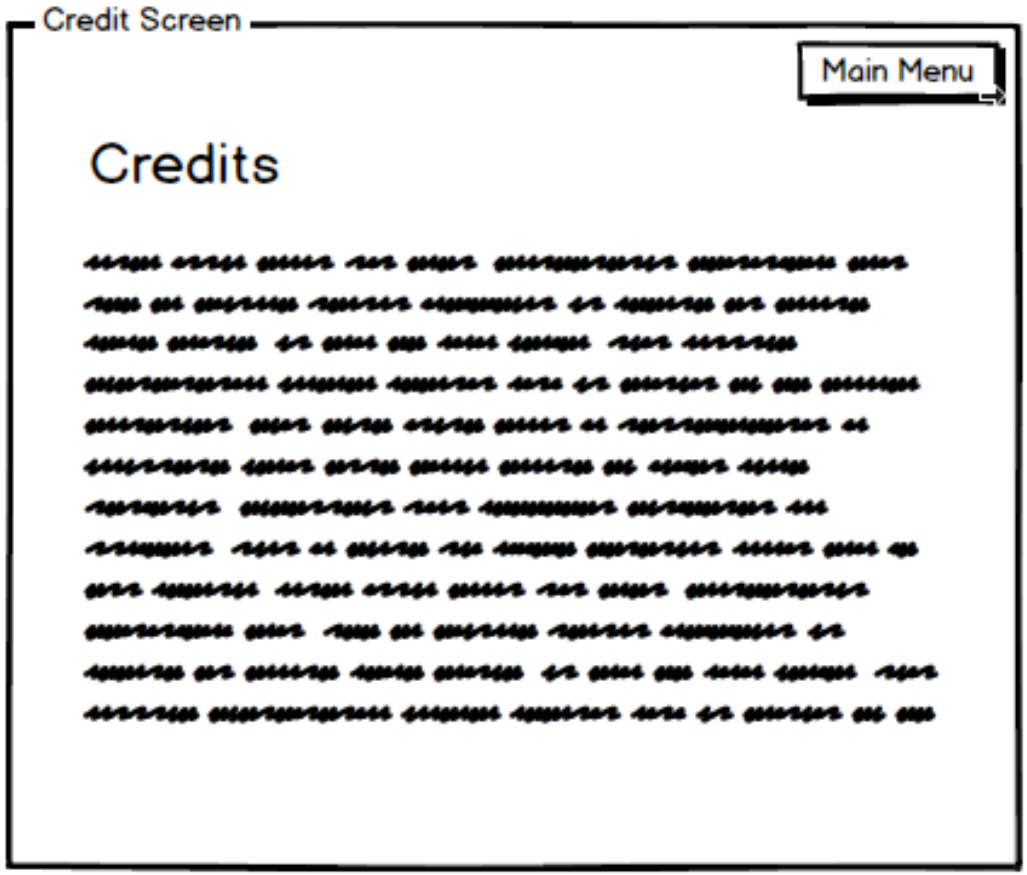
The scoreboard displays a list of all the battles, consisting of date, winner, game name, number of moves and the option to replay that game. It is possible to go back to the welcome screen by pressing the 'Main Menu' button.

Replay screen



The 'Replay Screen' gives you the possibility to replay the saved games. It is possible to go back to the welcome screen by pressing the 'Main Menu' button.

Credits



On the 'Credit Screen' the names of the project team and their work for the project are displayed as well as the sources of used pictures and music.