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ISTG 6010-01

Object Oriented Systems

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22 March 2025

DESIGNING A SOFTWARE SOLUTION FOR BATTLESHIP.

I want to start with a little backstory, I was talking to my parents on the phone and we got to talking and I said that I had homework to do, my mom asked what kind of homework I explained to her and it turned out that this game was very popular in my mom's childhood and that she was very good at this game, then she explained to me that Battleship is a two-player game in which each player tries to sink the other's fleet by guessing their location on a hidden grid. The game requires thinking, memory, and action planning.

**Telephone interview with my Mom.**

Me: Can you explain what the purpose of the game "Battleship" is?

**Mom:** The aim of the game is to find and sink all the enemy's ships before he sinks yours. Players take turns guessing where the opponent's ships are on the hidden grid.

Me: What are the basic parts of the game?

**Mom:** Each player has a board with two grids. One grid is for placing your own ships, and the other grid is for tracking hits and misses. There are five types of ships:

1. Destroyer (2 squares)

2. Submarine (3 squares)

3. Cruiser (3 squares)

4. Battleship (4 squares)

5. Aircraft Carrier (5 squares)

Me: How do players know which places they have already guessed?

**Mom:** Players use white pegs for misses and red pegs for hits. This helps them keep track of their moves and not repeat guesses.

Me: Are there any rules for placing ships?

Mom: Yes

A) Ships must be placed inside the grid.

B) Ships cannot overlap with each other.

C) Ships must be placed straight - either up and down or side to side. Diagonal placement is prohibited!

D) Once the game has started, you may not move your ships.

Me: How does the move work?

**Mom:** The player names a position, for example, "B4". The opponent checks to see if there is a ship there. If there is, he says "Hit!" If not, he says "Miss." The player then marks the result on his tracking grid.

Me: How does the game end?

**Mom:** A player wins when he hits all the points of the opponent's ships. For example, if you hit all 5 parts of an aircraft carrier, that ship sinks. If you sink all 5 of your opponent's ships, you win!

**User Stories**

1. As a naval combat player, I want a hidden grid to place my ships on so my opponent cannot see where they are.

For example: if I place my ships on my grid, my opponent should not be able to see them.

**Acceptance Criteria:** A) The game should have a private grid for each player. B) The opponent should not be able to see the other player's grid.

2. As a player, I want to guess a position each turn to try to hit my opponent's ships.

For example: on my turn, I call out "C7." My opponent checks and lets me know if he hit or not.

**Acceptance Criteria:** A) Players should be able to choose a coordinate (e.g., "D5"). B) The game must tell the player "Hit" or "Missed".

3. As a player, I want to have a way to keep track of my guesses, so I do not repeat the same move.

For example: if I already guessed "A2" and it was a miss, I should see a white peg there, so I do not have to guess it again.

**Acceptance Criteria:** A) The game should allow players to mark their guesses. B) White pegs should show misses, and red pegs should show hits.

4. As a player, I want the game to check the placement of my ships so that my ships do not overlap or go outside the grid.

For example: if I try to place my aircraft carrier on "H9" (which would go outside the grid), the game should not allow this.

**Acceptance Criteria:** A) The game should not allow ships to overlap. B) Ships must not be placed outside the grid. C) Ships must only be placed in straight lines.

5. As a player, I want the game to declare a winner when all of one player's ships have been sunk.

For example: if my opponent has hit all parts of my ships, the game should announce, "You lost! Your opponent has won."

**Acceptance Criteria**: A) The game should keep track of when a ship is completely defeated. B) The game must display a message when a ship sinks. C) The game must declare a winner when all ships are sunk.

**Problems and Possible Solutions**

1. Problem: Players may forget where they have already guessed.

Solution: The game should clearly mark past guesses with white and red pegs.

2. Problem: Players may try to cheat by moving ships during the game.

Solution: Once the game starts, the ships should stay in place and cannot be moved.

3. Problem: Players may not understand the game if they are new.

Solution: The game should have a short tutorial explaining how to play.

In this portfolio, I showed the requirements needed to develop a functional game "Battleship". An interview with my mother on the phone helped me learn more about the rules of the game, as well as what problems may arise and how to solve them. By implementing these requirements, a game can be developed.