AERSP 424 Final Project Report

Battleship with Abilities

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Overview

Our group created a version of the popular board game "Battleship", which is a game that simulates naval ship combat. It is a two player game where each player has their own grid board where they place their ships and try to guess the location of their opponent's ships by picking coordinates on the grid. The goal of this game is to be able to correctly guess and strike and sink all of the opponents ships before they can sink yours. Battleship is generally played on a 10x10 board with 15 ships each, however in our version we made it can be adjusted to however many grid spaces/ships you want. In addition our version also adds different powers/abilities that can be played.

Abilities

- Carpet bombing
  - Allows player to pick either an entire row or column to strike down.
- 2x2 bomb
  - Allows player to choose a 2x2 area and bomb it in a single turn
- Confirm hit
  - Guarantees a hit on a ship

Note: Each player starts with certain points and can spend these on the abilities throughout the game. However, these costs are not final and can be changed to the player's desire. Every normal hit gives you one point.

(Note: Abilities only work for player vs player mode, not for CPU vs player)

C++ Features Used

- Classes

- Conditional Statements

- For Loops

- While loops

- Inheritance

- Functions

- Pass by reference

- Arrays

- Strings

- Vectors

- Templates

- Memory Management

- Object Oriented Programming

- IO Streams

- Operator Overloading

<u>***Detailed explanation***</u>

When the game is started you will be prompted to to either choose player vs player or player vs CPU. After that you will then be asked to either place the ships manually or randomly. If you choose to place ships manually, players will be asked first to place whatever amount of ships that was set in the parameters.h file. In order to place the ships you need to enter the x coordinate first, then the y coordinate. The coordinates of each grid spot are also displayed about and to the left of the grid to avoid any confusion. After player 1 has finished placing all of their ships, player 2 will be asked to do the same. After that the game will begin with player 1 going first. Then the game will go back and forth until one side has all of their ships sunk. While taking turns, players can use their points and use abilities. For Player vs CPU, it will again ask the user to place their ships manually or randomly. The CPU's ships will always be placed randomly, and the CPU will always attack randomly as well..

<u>***Code Explanation***</u>

For Battleship Program the following files-

- Source- contains the int main() function

- Mainmenu - runs the main menu for the game

- Logger - Records all the output and later stores it in a .txt file

- Board - has all the functions needed to create the battleship board

- Player vs Player Mode

  - Player - has all the functions which is needed to play the game as a Player

  - Pvp - Calls a function from Board class to choose between manually or randomly

  - Placeship - Calls a function from Board class to place ships manually or randomly

- ○ Game - Has the function which switches turn between the players and also keeps the track of points.
- Player vs CPU
  - ○ Sorry - This class has all the functions needed to run this gamemode

Future Plans

In future, we plan to add the abilities to Player vs CPU mode and also to have connected ships