# Battleship

Matthew Ostin, Dane Van Horn, Rohan M.

Motivation for this project

- Our project 3 idea is going to be battleship. We decided to choose this as our idea because we all enjoy the game and feel we can put our own creativity into it.

Description of the problem we are trying to solve

- We are trying to create a game for fun but that also can create a challenging coding experience. There are plenty of other games that can be made like chess,checkers etc, but we feel that by creating battleships it is a different strategy that is not similar to others. Also, we feel like we can make sophisticated 'bot' algorithms that are sure to sink ships in the fastest possible way.

GUI sketch
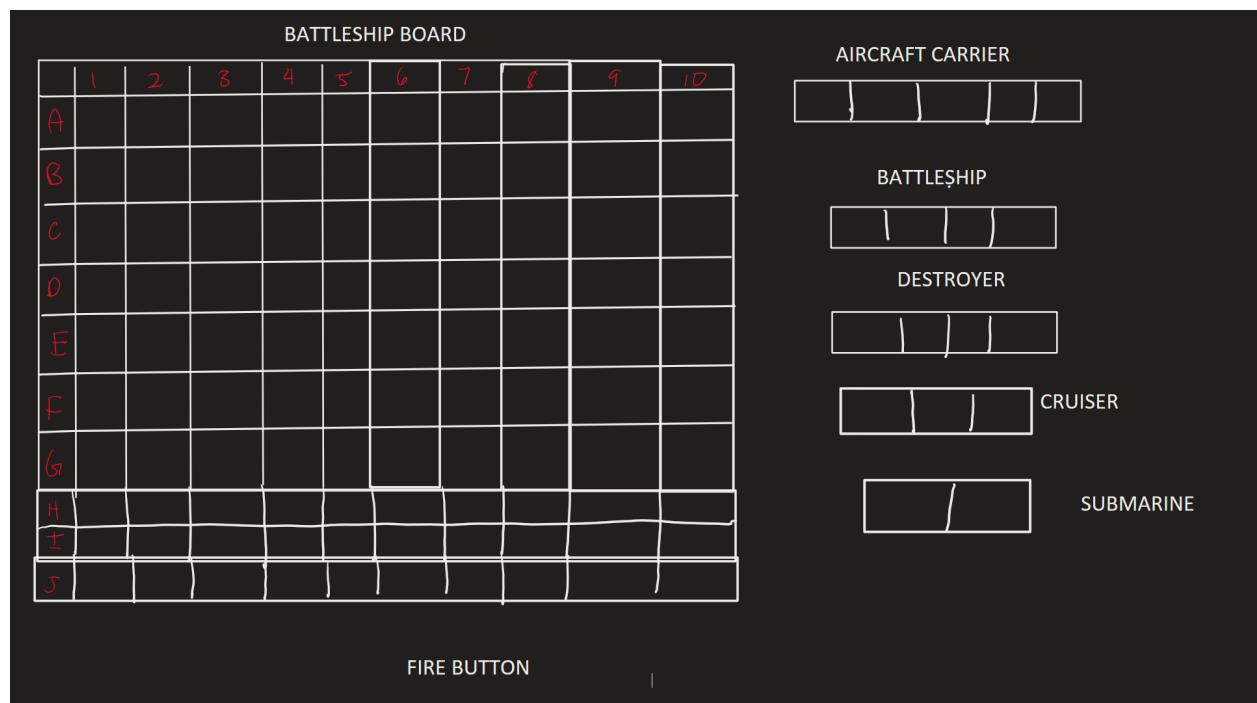
- Everytime we create a new game a new thread is being created. We are also considering the possibility of a multiplayer version, pending further research into the difficulty of the program on its own, which would implement networking.

How our project incorporates multithreading

- Everytime we create a new game a new thread is being created. We are also considering the possibility of a multiplayer version, pending further research into the difficulty of the program on its own, which would implement networking.

How our project will be sufficiently challenging

- Our project is significantly challenging because we are going to create multiple ways to play the game. For example, there is going to be a bot version and potentially a multiplayer version of the game. There will also be a lot of different modes to play, such as a hard mode against a bot or an easy mode. We will make the bot scan the board for the best possible move and that's how the difficulty will be made.

Testing plan

- We will test several different functional and non-functional cases:
  - Functional:
    - Bombs do nothing except marking a square that a boat is not on
    - Bombs explode, mark a square with a hit, and damage a boat upon a successful strike
    - Bombs destroy a ship of length n after n hits
    - The correct tile receives a bombing after being selected
    - Each player gets a turn
    - Hitting a boat gives the player another turn
    - All boats initialize and occupy the squares selected
    - The shoot button does not work when it is not the player's turn
    - The bots have correct functionality, placing boats and selecting different tiles to strike each turn
    - The game ends after all boats are sunk
    - The multiplayer servers can be accessed and work
  - Non-functional:
    - The better bots are consistently able to beat players, and the worse bots don't as often
    - The game looks good
    - The action listeners work when clicked
    - The game otherwise functions similar to battleship using action listeners

How the manager's workload will be adjusted

- The manager's workload will be adjusted by having them do more of the creativity part such as creating the ships and visuals rather than more coding (which is arguably less work). This evens out the workload and makes it even work for everyone.