

OOP

HW4 Design Template

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Title: Battleship Program

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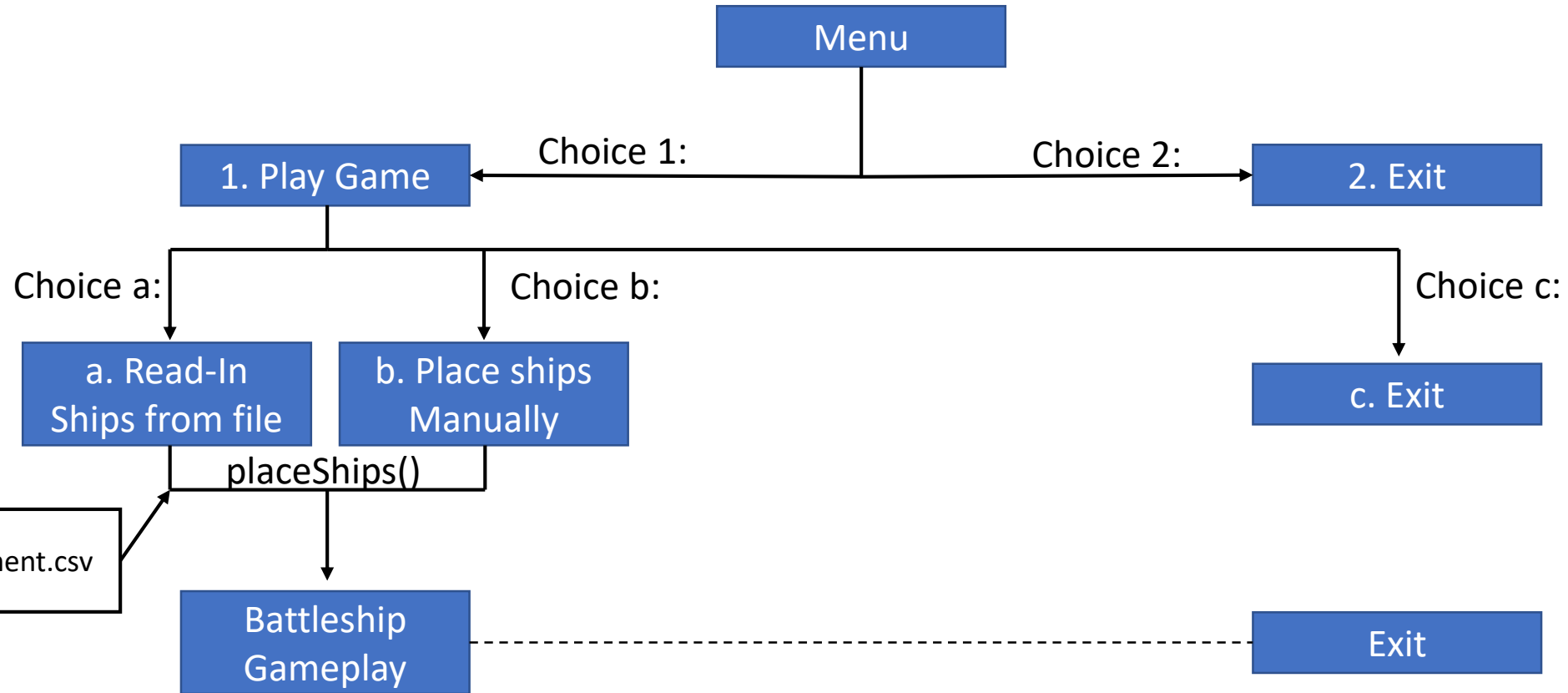
Problem Description:

This program creates a “Battleship” style game. The game requires the creating of multiple 10x10 grids, where the user and the computer opponent can place his/her ships. Each player also has a second grid which shows the location of torpedoes fired as well as “hits” to enemy ships. The game terminates when one player has destroyed or “sunk” all of the opponent’s ships. The program will read-in ship locations from a file for the user or allow the user to place them manually.

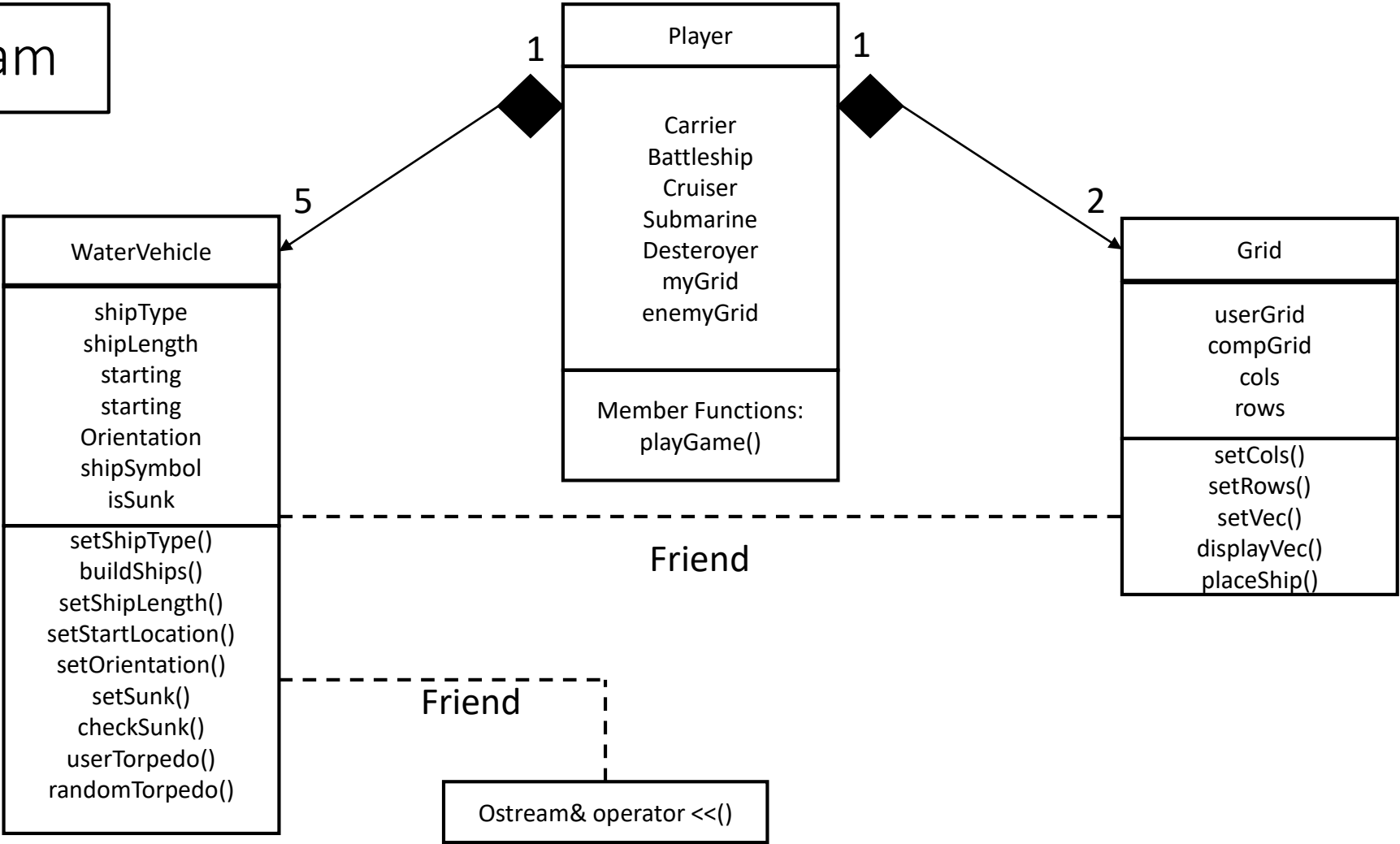
Overall Software Description:

The program contains three classes. The first is class “Player” which has two derived classes. The second class “Grid” is a derivative class of “Player.” The final class is “WaterVehicle” which creates the ships. The “WaterVehicle” class is also a derivative class of “Player.” Grid is responsible for creating up to four 10x10 grids and displaying the ship and torpedo locations. Grid has multiple functions which allow the players to choose coordinates for torpedoes and to output the grids. WaterVehicle creates the ships for both players and has functions which determine ship’s size, starting location, orientation, and whether the ship is sunk.

Activity (flow) Diagram



Class Diagram



Input Requirements

Main Menu

- Keyboard Input
 - Integer 1 – Play Game
 - Integer 2 – Exit

Ship Placement

- Keyboard Input
 - Character 'a' – Read in ship location
 - Ship_placement.asv
 - Character 'b' – Manual placement
 - Keyboard Input
 - Starting X coordinate (character 'a – j' or 'A – J')
 - Starting Y coordinate (integer 1 – 10)
 - Orientation (character 'v or h' 'V or H')
 - Character 'c' - Exit

Gameplay

- Keyboard Input
 - Torpedo X coordinate (character 'a – j' or 'A – J')
 - Torpedo Y coordinate (integer 1 – 10)

Output Requirements

Main Screen

- Print menu

Ship Placement

- Print ship placement options
 - A. Read in file
 - B. Manually place ship
 - Print user 10x10 grid after each ship placed

Gameplay

- Print user 10x10 grid
- Print blank 10x10 “torpedo” grid
- Print hit, miss, isSunk

End of Game

- Print ship statuses