RANK:

NAME:

GRADER:

RESULT: GO/NOGO

BATTLESHIP – JQR

**Objective**: Implement the game of battleship in C as a standalone project and then take the functionality of your standalone project and extend python with that functionality using a python C extension. You must check for valid input from the user and perform the following operations. When compiling the stand alone C Program you must compile with –Wall and –Werror turned on.

**Task 1:**

Implement a method for dynamically storing a game board that will be displayed in rows and columns in a file; this board will be at a minimal 10x10 and cannot be a hard coded value, it will be a given value randomly at runtime. Additionally this function should place each ship listed below without any overlap and ensure that the entirety of the ship is present on the game board. Lastly each ships orientation and placement must randomly be determined and cannot be a hard coded value. (Hint remembering to seed rand() will produce a better result).

**Task 2:**

Implement a method to save the game board to a file, each row of the board should be saved onto its own line in the file. Additionally all file saves will take a filename to save the file as.

**Task 3:**

Implement a method to fire a round at your game board and determine if a hit was made; in the event of a hit you are expected to return “HIT”, otherwise return “MISS”.

**Task 4:**

Implement a method to return the number of active ships left on the game board. Use Logic to determine this instead of a hard coded value.

**Task 5:**

Implement a method to open a game board specified by the user and copy the contents of that file into your game board.

**Task 6:**

Integrate your Battleship Functions with the JQR Client/JQR Server. By completing the task specified by the JQR server and sending the result back via the JQR client. For this you will need to make a C extension Module. A link to a video and the python documentation regarding this topic has been included in the “Extending Python Tutorial.txt”.

**What We Are Looking For**: During this project we want to see efficient memory management, sound use of structures, File I/O and overall program structure and logic. All the skills needed to complete this project have been taught in class with the exception of extending python using C. In order to account for the C extensions of python additional materials to include links to a video and the python user’s docs regarding C extensions for python have been included. If there are questions please do not hesitate to reach out to CW2 Schell or SSG Jaramillo.

**Ship Details:** Below are the types and lengths of each ship.

TYPE LENGTH

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Patrol boat 2

Submarine 2

Cruiser 3

Destroyer 3

Battleship 4

Aircraft Carrier 5