MEDGAR EVERS COLLEGE
The City University of New York

Programming Project B

Directions:

You will be creating a terminal game; that is, a game that will be played on the terminal. Likewise, it will be either a single player or two player (player vs computer or player vs player) game from the following list

Connect 4 **(PvP)**	Sudoku **(SP)**	Checkers **(PvP)**	Chess **(PvP)**
Shogi **(PvP)**	Go Fish **(PvC)**	Minesweeper **(SP)**	Scrabble **(PvP)**
Yahtzee **(SP)**	Go **(PvP)**	Wheel of Fortune **(PvP)**	Sorry **(PvP)**
Trouble **(PvP)**	Uno **(PvC)**	Chinese Checkers**(PvP)**	Crazy Eights **(PvC)**

where **PvP** is player versus player, **PvC** is player versus computer and **SP** is single player.
The guidelines for your program are:

- It must consist of at least five functions excluding the main function, an initialization function, a display function, a game function, and a results function.
- The main function must only call the game function.
- The initialization function is responsible for initializing all of the game resources which are pointers, structures, arrays and variables that are essential to the game play, which means they are used throughout the game lifecycle to represent new states of the game. It should only perform I/O if it is absolutely necessary. And its parameters should be the essential game resources. Likewise, it does not need to return anything, however, it can if you find it necessary.
- The display function is responsible for displaying all necessary game statistics such as a board, the current player, points and so on for each instance of the game loop. The displays must be neatly formatted. Its parameters must be at least all essential game resources necessary for the display. But, it must not modify data and its return type must be void.
- The results function is responsible for displaying the end of game statistics such as the winner, scores and so on. Its parameters are anything necessary to perform its task. Likewise, its return type must be void.
- The game function is responsible for declaring the essential game resources, initializing them by calling the initialization function, executing the game loop, and then, calling the results function in that order. Besides declaring the essential game resources, it must only declare resources that are needed for the game loop such as a counter variable or storage for return-value functions. It must not do any calculations or displays directly; it must call functions for those tasks. Specifically, within the game loop, it makes decisions based on the results of function calls. Furthermore, the game loop must only terminate when the game ends (a winner is decided, it ends in a draw, or a counter runs out). If an invalid input is entered, a new request for the input must be made until the input is valid. Lastly, the function must take no parameters and its return type must be void.
- Global scope must only consist of function definitions and prototypes and struct definitions and declarations.
- The program can only include the libraries iostream, string, cmath, cctype, ctime, cstdlib, cstdio, fstream, sstream, and iomanip.
- The program cannot include any resources that were not covered in class unless they are miscellaneous resources from topics covered.

Failure to follow any of the above guidelines will result in a 0 for the project.

Timeline:

Your program will be developed over time in stages. There will be four stages and each stage will have a time limit. Furthermore, each stage may consist of coding, designs or both. The work completed in previous stages can always be modified in later stages as your understanding of coding and design improves, however, a changelog must be provided for the changes to be accepted. Last, all stages will be graded and the grades will be final. The stages are:

I. **Planning**

You will research your game choice. After your research, you must write a description of the game, which must include its name, its rules, and your modifications to the game for your program. It should not exceed two paragraphs. This file must be a txt file.

2 pts

II. **Requirement Analysis**

Make a list of the essential resources, functions and libraries you may need to accomplish your goal. The list must include a short description of the purpose of each resource, function and library. Moreover, for functions, write only their function prototype. Furthermore, do not include the main function. This file must be a txt file.

2 pts

III. **Design**

Create a detailed algorithm of your program which should consist only of algorithms for each function you will define in your code, which should only be the functions in the requirement analysis stage. Do not include the main function. This file must be a txt file.

6 pts

IV. **Coding**

Write out the source code for your program. It should not include any functions that are not in the design stage. Without question, this file must be a cpp file. Your grade will be based on the following rubric:

Project Grading Rubric

Category	Task	Points
Specification	◦ Program compiles. ◦ Program performs required tasks. ◦ Program produces accurate and formatted outputs.	8
Readability	◦ Program uses meanful identifiers. ◦ Program indents scopes.	2
		10

Any stage saved in the wrong format will not be graded. Any form of plagiarism at any stage will result in a 0 for the entire project; the later stages will not be accepted and the grades of the earlier stages will be changed to 0.