Due Date: 10/28/24 @11:59PM

CSC240 Assignment #8

Now that we have completed our first fully functional game, we are going to switch gears and start learning about various data structures that are useful in the word of programming and in game development. Each week, we are going to tackle a different data structure and use it to implement a classic board/card/video game. This week we will be tackling DS_Grids! DS_Grids are pretty much 2D arrays, with which you should hopefully be somewhat familiar with already, however, DS_Grids offer a ton of different functionality that 2D arrays do not in Gamemaker, making it a more viable option for path-finding and grid-based games. We will not be diving into systems as complex as the aforementioned, but we should learn the basics, as it may prove extremely useful to us later. For this week, we are going to be implementing a single-player version of the classic popular board game, Battleship!

All of our projects will now be Parson-esque going forward. I will give you the Gamemaker project for a fully functional implementation of the game, however, I have removed certain elements from the code that you must complete. For this assignment, I have created the UI, Gamemaker Objects, and defined a few Structs that are used in the implementation. You are responsible for creating the Board struct, as it will utilize 1-dimensional arrays and DS_Grids in its implementation. The script file containing the structure of the Board Struct is already created for you. Inside of the Board Struct, you will find that I have provided for you the following:

- All attributes for the Board Struct as well as brief descriptions of what each of these attributes are used to represent/control
- The names and parameters of all of the methods that you must implement. (NOTE: function names must remain the same, as they are referenced in various areas of the code)
- Documentation for each function that specifies what that function is to do, what the parameters represent, and what the return value should represent.
- One singular fully-completed .toString() method for your testing.

You are simply responsible for filling in the empty Struct methods with the code that would perform the specified actions. I would suggest porting all of the Structs (mainly the Cell, Ship, and Board structs) out into a blank project and testing each of the functions as you write them. Make use of the .toString() methods for the structs! They will be extremely useful in making sure you are performing these actions appropriately. Once you believe that you have the Board Struct up and running, paste this into the fully-working project that I have provided to you and if it works properly, then congratulations, you've done it!

Please note: You only need to edit the Board Struct script file. There does not need to be any other changes made to any of the other files or code in the Gamemaker objects, however, I would highly recommend taking a look at these areas and understanding what they do, as this may make your implementation a bit easier. I have made sure to incorporate thorough documentation to guide you through all areas of the program. 😊

When you have completed the assignment, please zip up your Game folder and submit it to the Week 8 Assignment Dropbox.