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Foundations of Programming

Project 3

* Import the random module.
* Define the global variables including grid, grid\_size, num\_of\_ships, and column\_list.
* Define the drawBoard() function.
  + Use a for loop to print out the board as well as label the rows.
  + The columns will be labeled by column\_list
* Define setupBoard() to place all the water and ships
  + Create a variable to represent the ships that have been placed.
  + Place a “.” in each cell for I and J to represent water.
  + Use a while loop to check if the random ships placed are less than the number of ships due to an overlap.
  + If a ship is not overlapped add one to ships placed until it is 5.
* Define a HitOrMiss() function to check the outcome of the user's input.
  + If - else statement to determine if it was a hit (“X”) or a miss (“O”).
* Define a function called IsGamerOver() which will check if the game is over.
  + If statement to see if any of the cells in the grid are equal to “S”. If they are, return False signifying the game is not over.
  + If they are not, return true signifying that all the ships have been sunk and the game is over.
* Define a main function which will call all of the previous functions to perform their actions.
  + Call setupBoard() to initialize all of the ship placements and water on the board.
  + Use a while loop checking “while not isGameOver()” call drawboard which will print the board.
  + Create try - except block to ask for the users input and if they are not the values from 0-9, give an error statement and ask again.
  + If the input is valid, the HitOrMiss() function is called to perform the task of checking whether the input was a hit or a miss and printing the correlated value on the updated grid.
  + If the isGameOver() function detects no ships, the while loop will stop and print(“GAME OVER”)
  + Finally main is called at the bottom and the 2D array which is the global variable “grid” is passed in for myBoard.