~~Independent~~ Programming Assignment 1

Mine Guesser (Python)

Assigned/Due: See zyBooks for exact due date

*All portions of this project due by 11:55pm on the due date.

YOU MAY WORK WITH OR WRITE CODE TOGETHER WITH A SINGLE PARTNER THIS ONE PROJECT.

This assignment will be graded on the following criteria:

Compiles and runs	30%	(Your program **MUST** compile in order to be considered for grading)
Correctness	40%	(Your program must satisfy each requirement of the specifications)
Style	20%	(Your program must use comments and have user-friendly output)
Instructions	10%	(You must include any other materials requested in the lab)

Problems

Write a Python application that allows you to play a simplified “minesweeper” game (the game bundled with the older version of Windows). A “compiled” Java JAR file has been included in the Google Drive for this assignment so you can play the game to get a feel for what your program should be doing.

NOTE: The JAR file is an executable file created with Java code…but we will be writing our code in Python.

You will be using the code in the source code template to instantiate a hardcoded, 5×5 multi-dimension array (i.e., an array with 5 columns and 5 rows) mine board which has hidden 5 mines within the 25 cell board.

The skeleton template for this lab is customized and has a fair amount of code/structure already completed for you. You will need to insert code at the 4 locations marked by “TODO” comments in the template. Use the comments in the code template and the criteria below to write your application:

- ***NOTE: DO NOT change the location of the hidden mines or you will receive a 0 from the auto-grader.***
- When your program is run:
    - The user starts with a score of 5 points.
    - The game is over with a win or loss:
        - The player **loses** when they reach 0 points or below (*NOTE: The game is not necessarily over when a mine cell is chosen*).
        - The player **wins** when they have selected all the empty cells (20) without ever reaching 0 points.
        - **Print out the FINAL STATE of the board when game is over** (see below)
    - The program repeatedly asks the user, **in two questions**, to enter a row (0-4) and then a column (0-4).
        - The program will then check the specific row-column cell:
            - If a mine is found:
                - **Subtract 4 points from the score & print the updated score in this manner:** “After round X score is: X”

            - If a mine is NOT found
                - **Add 1 point to the score & print updated score in this manner:** “After round X score is: X”
            - **Print out the CURRENT STATE of the board no matter what the guess is** (see below)
- If need to print out the board, do so in the following manner:
    - For the **CURRENT STATE** of the board, while game is still being played:
        - Use ‘?‘ to represent unexplored cells
            - NOTE: Do NOT show hidden mines, just show as unexplored
        - Use ‘M’ to represent mines that have been revealed
        - Use ‘E‘ to represent empty cells that have been revealed
    - For the **FINAL STATE**, after the game has been won or lost:
        - Use ‘m’ to represent mines that have NOT been revealed
        - Use ‘e‘ to represent empty cells that have NOT been revealed
        - Use ‘M’ to represent mines that have been revealed
        - Use ‘E‘ to represent empty cells that have been revealed
        - Must print out “Oh no, you LOST!” or “Nice job, you WIN!” (both without quotes)

Example of Current State after guessing: r=3, c=2 & r=2, c=2	**Example of Final State**
? ? ? ? ?	e e e e e
? ? ? ? ?	e m e m e
? ? E ? ?	e e E e e
? ? M ? ?	e e M e e
? ? ? ? ?	e e m m e

Sample Console

Sample input/output is shown below; your output should look ***EXACTLY*** the same (green text is user input), for the given test case. You can use this data to test your program; but, YOU MUST create two new test cases of your own to submit, as described in the Submission Instructions below.

NOTE: It is okay for spacing to be off a little (we will 'ignore spacing').

```
Jordan & Sadie
Project 1 - Python Mine Guesser
------------------------------------------
Please enter a row number (0-4): 0
Please enter a col number  (0-4): 4
You hit a mine! -4 points :-(
After round 1 score is: 1
?     ?     ?     ?     M
?     ?     ?     ?     ?
?     ?     ?     ?     ?
?     ?     ?     ?     ?
?     ?     ?     ?     ?
------------------------------------------
Please enter a row number (0-4): 2
Please enter a col number  (0-4): 0
You guessed an empty space! +1 points :-)
After round 2 score is: 2
?     ?     ?     ?     M
?     ?     ?     ?     ?
E     ?     ?     ?     ?
?     ?     ?     ?     ?
?     ?     ?     ?     ?
_____________________
.
.
.
Please enter a row number (0-4): 1
Please enter a col number  (0-4): 3
You hit a mine! -4 points :-(
After round 4 score is: -1
?     ?     ?     ?     M
?     ?     ?     M     ?
E     ?     ?     ?     ?
?     ?     ?     ?     ?
?     ?     ?     ?     E
*****Oh no, you LOST!!*****

Final board:
e     e     e     e     M
e     e     e     M     e
E     e     m     e     e
e     m     e     e     e
m     e     e     e     E
```

Submission Instructions

1.) Templates: Use the relevant template file(s) for this lab found in the Google Drive

   a. Use the specified .py source file template for each [CODE] problem and **DO NOT change the file or class names** (doing so will cause your code to receive a 0 by the autograder)

      i. Make sure to update the header and name *print* statements

   b. Submit the console results (showing input and output) for at least **2 different test cases** you created to convince yourself that your program is working properly; place test cases at the very end of your .py file in the space provided by the template for test cases.

2.) zyBook Submission: **Make sure your name is on all files you turn in.**

   a. Submit the relevant .py file(s) under the appropriate lab assignment

      i. Check to make sure all the files contain your latest work before submitting

   b. The final grade and grading feedback will be returned to you via the Canvas assignment section