Problem: Submarine Finder.

Design a program that allows you to search for 3 submarines in a given ocean represented as 60x15 board structure. To play, enter the coordinates of the point in the ocean you wish to search (as x, y integer coordinates of the board). The program will tell you how far away you are from the closest submarine, if you are in relative close proximity.

Submarines do not move around. You can detect a submarine up to a distance of 9. If all submarines are out of range, the point will be marked with 0. If your point is directly dropped on a submarine, you have discovered its the location, and it will be marked by 0. The marked point will remain there till the end of the game. When you find a submarine, all points will be updated to locate the next closest submarine.

Your assignment is to implement the following functions inside the given file ‘submarine.py’:

1) Function `showInstructions` that shows the game instructions on the screen (make your own decision on the input/output parameters):

Here are the game instructions to be displayed to games:
Instructions
*************
You are the captain of the Simon, a submarine hunting ship. Your current mission is to find the three submarines that are lurking in the part of the ocean you are in.

To play, enter the coordinates of the point in the ocean you wish to search. The program will tell you how far away you are from the closest submarine, if you are in relative close proximity.

For example, here is a submarine (the s) located at a distance of 2 away from the drop point (the d):

```
  22222
 s   2
 2   d 2
 2   2
 22222
```

The point where the device was dropped will be marked with a 2. Submarines do not move around. You can detect a submarine up to a distance of 9. If all submarines are out of range, the point will be marked with 0.

If your point is directly dropped on a submarine, you have discovered its the location, and it will be marked by 0. The marked point will remain there till the end of the game.

When you find a submarine, all points will be updated to locate the next closest submarine.

2) Function `playAgain()` that asks player if s/he wants to play again and returns True if the player wants to play again, otherwise it returns False.
3) Function `enterPlayerMove()` that asks player to give her/his move (x, y integer coordinates). Checks if the given input are valid (int and within the board coordinates). Returns a list of these 2 coordinates.

Input function parameters – no parameters
Output function parameters – return list [x,y] of coordinates

A function call to this function should be put in the main part, at the place shown by the respective comment.

4) Function `isValidMove` returns True if the coordinates are on the board (with limits of 60x15), otherwise False. (make your own decision on the input/output parameters).

5) Function `getRandomSubmarines()` that creates a list of submarines data structures. Each submarine is a list of two elements: its x, y int coordinates.

Input function parameters – number of submarines
Output function parameters – a list of the list [x,y] of each submarine coordinates

Each coordinate must be obtained randomly by using the random library. To generate a random number within a given range `rag` you can type in Python

```python
number = random.randint(0,rag)
```

A function call to this function should be put in the main part, at the place shown by the respective comment.

**NOTE 1:** Make sure you do not modify the functions provided inside the 'submarine.py' file! Your task is to add your functions in the file without modifying the existing ones!

**NOTE 2:** Make sure you make correct functions calls in the 'main' part of the program. The places where you need to put your own function calls are marked by comments as # HERE FUNCTION CALL ...

**NOTE 3:** A board structure of 60x15 can be represented in Python as a list of 60 elements (which each can be lists or strings; here they are strings of 15 characters long).

**Instructions:**
- Save your homework as `hw3_yourname.py`
- Submit the readme file to briefly explain the structure of your code
- Submit your homework by putting it into your class folder `cs130r/hw3`
- Make sure you include your header at the beginning of the file:
  ```
  # Your name - Your Emory email address
  # Your collaboration statement - the wording of the collaboration statement should be:
  "I worked on the homework assignment alone, using only this semester's course materials." OR
  "I/We worked on this homework with [give the names of the people you worked with] and/or referred to
  [cite any texts, web sites, or other materials not provided as this semester's course materials for CS
  130R]."
  ```
- Make sure your program has no errors (i.e., it runs!).
Grading Criteria – Total max 100 points

Correct file name  10 points
Correct submission  10 points
Header  10 points
Each correct function definition  10 points (total, if all operations are correct, 50 points)
Each correct function call  10 points (total 20 points)

Two weeks late  0 points
Program has syntactical errors  -50 points
Provided functions have been changed  -50 points

All these functions should be called (used) in the main part of the program to complete the job. To get the points you need to define these functions and then use them within your own assignment code, and then to make sure the program runs correctly!

GOOD LUCK!

Examples run:

cs130r00@lab0z:~/Desktop/try$ python3 submarine.py
SUBMARINE SEARCH!

Would you like to view the instructions? (yes/no) no

0123456789012345678901234567890123456789012345678901234567890123456789

0 ....................................................................................................................... 0
1 ....................................................................................................................... 1
2 ....................................................................................................................... 2
3 ....................................................................................................................... 3
4 ....................................................................................................................... 4
5 ....................................................................................................................... 5
6 .................................................................................................................................. 6
7 ....................................................................................................................... 7
8 ....................................................................................................................... 8
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10 ............................................................................................................... 10
11 ............................................................................................................... 11
12 ............................................................................................................... 12
13 ............................................................................................................... 13
14 ............................................................................................................... 14

012345678901234567890123456789012345678901234567890123456789

You have 16 trials left. 3 submarines remaining.
Where do you want to search next? (0-59 0-14) (or type quit) quit

Thanks for playing!
SUBMARINE SEARCH!

Would you like to view the instructions? (yes/no)  no

0123456789012345678901234567890123456789012345678901234567890123456789

0 ....................................................................................................................... 0
1 ....................................................................................................................... 1
2 ....................................................................................................................... 2
3 ....................................................................................................................... 3
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0123456789012345678901234567890123456789012345678901234567890123456789

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You have 16 trials left. 3 submarines remaining.

Where do you want to search next? (0-59 0-14) (or type quit)  5 5

0123456789012345678901234567890123456789012345678901234567890123456789

0 ....................................................................................................................... 0
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2 ....................................................................................................................... 2
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You have 15 trials left. 3 submarines remaining.

Where do you want to search next? (0-59 0-14) (or type quit)
You have 14 trials left. 3 submarines remaining.
Where do you want to search next? (0-59 0-14) (or type quit)

4 0

You have 13 trials left. 3 submarines remaining.
Where do you want to search next? (0-59 0-14) (or type quit)

6 0
You have found a submarine!
You have 12 trials left. 2 submarines remaining.
Where do you want to search next? (0-59 0-14) (or type quit)

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