CS 162
Programming Lab 2

For this exercise, you will create a simple Dungeon Crawl game. For an enhanced version, you can add monsters that randomly move around.

Program Requirements

While the program is an introduction to two-dimensional arrays, it is also a review of functions and input validation.

Create a program that displays a simple dungeon and allows the player to explore it. For example, in the following example G is the player, T is a trap, and X is the treasure. If you hit a trap, you fail. If you reach the treasure you win.

```
. . . . . . . . . .

. G . . . . . . . .

. . . . . . T . . .

. . . . . . . . . .

. . . . T . . . . .

. . . . . . T . . .

. . . . . . . . . X
```

For each move in the game, the user will enter a character for **L**eft, **R**ight, **U**p, or Down. You need to move the player accordingly and update the dungeon.

Define the size of your dungeon with a constant MAX_SIZE. Then create the dungeon as a MAX_SIZE x MAX_SIZE 2D array.

The functions you need to implement are:

1) createDungeon – initializes a new dungeon
   a) pass in the dungeon and a number for how many traps to place
   b) randomly place that many traps in the dungeon
   c) randomly places treasure and player
   d) make sure that each item placed is in a separate location
   e) return type should be void
2) displayDungeon – displays a dungeon
   a) pass in the dungeon
   b) display the dungeon
   c) return type should be void

3) getMove – gets and validates a move (L,R,U,D)
    a) pass in the current location as x and y coordinates
    b) get a move from the user and validate it (legal move and to a location inside the dungeon)
    c) return the move as a single character
4) checkMove – sees if the move is onto a trap or treasure
    a) pass in the dungeon, object code you are checking for (trap or treasure), the move
    b) check the move to see if onto a space containing the trap or treasure
    c) This function should be called to check for traps and treasure separately
    d) returns true if the move is onto the object passed in
5) updateDungeon -- updates the dungeon for the next cycle
    a) pass in the dungeon and the move
    b) update the dungeon moving the player marker (place a new player and clear the old spot)
    c) return type should be void

Enhancements

For a more advanced version, add several monsters that randomly move one step in any direction each term. They must not go outside the limits of the dungeon. If the player moves onto an occupied square, she loses.

Your program could also ask the user if they want to play another game and repeat if the response is y.

Programming Suggestions

You should define the board in main and pass it to each of the functions that should access it. Note that when you are passing it, you will be passing it using its address and changes made to the board in a function change the board everywhere.

To pass a 2d array, you need to use something like the following:

```
void showBoard(char theBoard[][MAX_SIZE])
```

or

```
void showBoard(char theBoard[MAX_SIZE][MAX_SIZE])
```