CECS 277 – Lab 2 – 2D Arrays

Bug Grid

A ladybug is crawling along a 10x10 grid. It starts at location 0,0 and must get to the finish at location (9,9). Write a program that allows the user to control the ladybug to get to the finish, but do not allow the user to move outside of the grid boundaries. Draw a trail everywhere the ladybug has been.

1. Create a 10x10 array of characters. Fill it with '.'s to represent the empty grid.
2. Create variables to store the location of the bug, initialize them to (0,0).
3. Make a method that passes in the grid, and the bug's location and then displays the grid with the bug at that location as the character 'o'.
4. Make a repeating menu that allows the user to choose the direction they want the bug to move.
   Examples:

1.	North		W.	Up
2.	West	or	A.	Left
3.	South		S.	Down
4.	East		D.	Right

5. Check that the direction the user chose does not move the bug out of bounds of the array, if it does, display a message that they cannot move there. Otherwise, update the bug's location.
6. Check if the bug has reached the finish. If it has, then display the grid one more time with a congratulatory message.
7. If the bug has not reached the finish, mark the location on the grid as an 'x' to signify that that location has been visited (so the bug leaves a trail).
8. Extra Credit (+1 point): Once you're finished, add barriers ('X's) in the grid to make it more challenging to reach the finish (like a maze). Check to make sure the bug cannot pass through the barriers while moving (check all directions).

Example Output:

```
o  .  .  .  .  .  .  .  .  .
.  .  .  .  .  .  .  .  .  .
.  .  .  .  .  .  .  .  .  .
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.  .  .  .  .  .  .  .  .  .
.  .  .  .  .  .  .  .  .  f
Which Direction:
W. Up
A. Left
S. Down
D. Right
w
Cannot move outside of grid!
s
```

```
x  .  .  .  .  .  .  .  .  .
o  .  .  .  .  .  .  .  .  .
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.  .  .  .  .  .  .  .  .  f

...

x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  x  x  x  x  x  x  x  x  .
.  .  .  .  .  .  .  .  x  .
.  .  .  .  .  .  .  .  x  .
.  .  .  .  .  .  .  .  o  f
Which Direction:
W. Up
A. Left
S. Down
D. Right
d
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  .  .  .  .  .  .  .  .  .
x  x  x  x  x  x  x  x  x  .
.  .  .  .  .  .  .  .  x  .
.  .  .  .  .  .  .  .  x  .
.  .  .  .  .  .  .  .  x  o

You win!
```