**Program #3 "The Swamp"**

**Background and Assignment:**

**The 90% credit solution: Solve sampe 1 and 2 correctly**

Program #3 will use a 2D array of integers to represent a swamp. Every value of 0 represents quicksand (or alligators) while every value of 1 represents solid ground (or no alligator). You will also be given an x,y pair representing your starting position inside the swamp on a block of solid ground. Your job will be to follow the trail of 1's (solid ground) to the edge of the swamp - or until it dead ends. You will take one step at a time in any direction as long as that step is onto solid ground ( 1 ), and not into quicksand ( 0 ).

Put simply, you are dropped into the swamp onto a 1 (safe) block and starting there, must follow the trail of 1s, one step at a time until you either reach the edge of the swamp (rescued) or reach a dead end (stranded).

You are guaranteed the following:

1. There are no cycles in your path to freedom or dead end ( thus no backtracking needed ).
2. You will start out on a block of solid ground.
3. There is only one possible path to take, and thus only one possible correct output for any given swamp.
4. Exception to the rule above. The 3rd swamp is optional and has MULTIPLE paths out. You must find them all

[**swamp1.txt**](http://www.cs.pitt.edu/~hoffmant/401/program-03/swamp1.txt)

**Swamp1 is 10x10 and you are dropped in at row 2 col 3  
Swamp #1 has exactly ONE escape path from the drop in point to the edge.**

10 2 3

0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 **1**

0 0 0 **1** 0 0 0 0 **1** 0

0 0 0 **1** 0 0 0 **1** 0 0

0 0 0 0 **1** 0 **1** 0 0 0

0 0 0 0 **1** 0 0 **1** 0 0

0 0 0 0 **1** 0 0 0 **1** 0

0 0 0 0 0 **1** 0 **1** 0 0

0 0 0 0 0 0 **1** 0 0 0

0 0 0 0 0 0 0 0 0 0

[**swamp2.txt**](http://www.cs.pitt.edu/~hoffmant/401/program-03/swamp2.txt)

**Swamp #2 is a DEAD END. Starting at row 2, col 8 there is no way out since it dead ends before reaching the edge.**

10 2 8

0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0

0 0 **1** 0 0 0 0 **1** **1** 0

0 0 0 **1** 0 0 **1** 0 0 0

0 0 0 0 **1** **1** 0 0 0 0

0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0

**The only modifications you are to make to the starter file are to fill in the code for onEdge(), nextStep() and loadSwamp()**

**Do not write any code that produces output. I have taken care of that to facilitate script grading**

**Your output must match mine exactly (for swamps 1 & 2).**

**Here is your**[**Starter File**](http://www.cs.pitt.edu/~hoffmant/401/program-03/Program3.java)

**YOUR OUTPUT SHOULD LOOK LIKE THIS**

|  |
| --- |
| SWAMP1  0 0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0 1  0 0 0 1 0 0 0 0 1 0  0 0 0 1 0 0 0 1 0 0  0 0 0 0 1 0 1 0 0 0  0 0 0 0 1 0 0 1 0 0  0 0 0 0 1 0 0 0 1 0  0 0 0 0 0 1 0 1 0 0  0 0 0 0 0 0 1 0 0 0  0 0 0 0 0 0 0 0 0 0  STARTING AT: [2][3]  STEPPED TO: [3][3]  STEPPED TO: [4][4]  STEPPED TO: [5][4]  STEPPED TO: [6][4]  STEPPED TO: [7][5]  STEPPED TO: [8][6]  STEPPED TO: [7][7]  STEPPED TO: [6][8]  STEPPED TO: [5][7]  STEPPED TO: [4][6]  STEPPED TO: [3][7]  STEPPED TO: [2][8]  STEPPED TO: [1][9]  ESCAPED AT: [1][9]  SWAMP2  0 0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0 0  0 0 1 0 0 0 0 1 1 0  0 0 0 1 0 0 1 0 0 0  0 0 0 0 1 1 0 0 0 0  0 0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0 0  STARTING AT: [2][8]  STEPPED TO: [2][7]  STEPPED TO: [3][6]  STEPPED TO: [4][5]  STEPPED TO: [4][4]  STEPPED TO: [3][3]  STEPPED TO: [2][2]  STRANDED AT: [2][2] |

**The 100% solution: Solve swamp 3 correctly (after solving 1 & 2 correctly of course). Note that it has MULTIPLE escape paths. You must find and print them all**

Your swamp 3 will not be graded unless swamp 1 and 2 are completely correct.

**Swamp 3 is a 10x10 swamp. You are dropped in at row 1 col 1.**

**DO NOT HAND IN YOUR SWAMP 3 SOLUTION. EMAIL IT TO ME FOR HAND GRADING \*AFTER\* THE SCRIPT VERIFIES YOUR 1 & 2**

[**swamp3.txt**](http://www.cs.pitt.edu/~hoffmant/401/program-03/swamp3.txt)

**10 1 1**

**0 0 0 0 0 0 0 0 0 0**

**0 1 0 0 0 0 0 0 1 1**

**0 0 1 1 1 1 1 1 0 0**

**0 0 0 0 0 0 0 0 1 0**

**0 0 0 0 0 0 0 1 0 0**

**0 0 0 0 1 1 1 0 1 0**

**0 0 0 1 0 0 0 0 0 1**

**0 0 1 0 1 0 1 0 0 0**

**0 1 0 0 0 0 0 1 0 0**

**1 0 0 0 0 0 0 1 0 0**

**The ouput is variable since your algorithm may traverse the path in any of the many possible orderings. It must of course be of the sameformat as the first two swamps.**