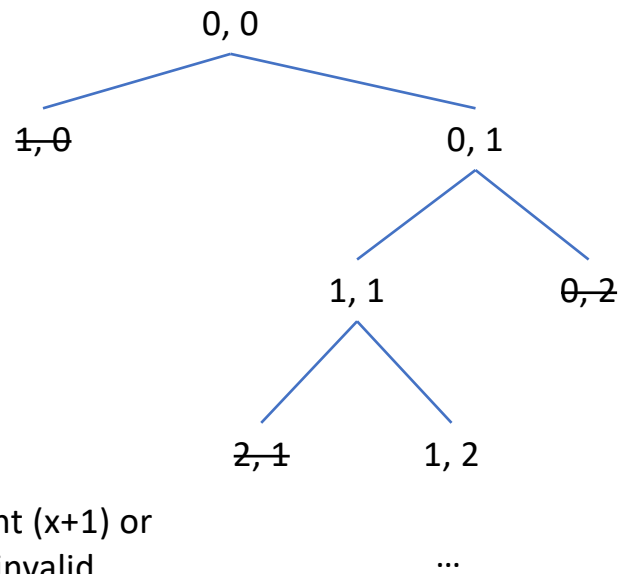
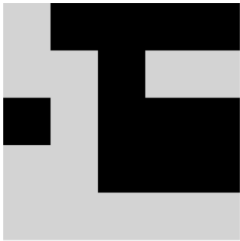


Tree of x,y positions moving through this maze



At each step it is only possible to move right ($x+1$) or down ($y+1$). But sometimes those may be invalid because they run into a wall or off the edge of the maze.

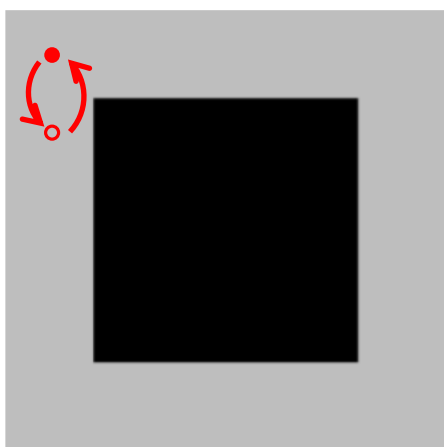
Do not assume each position can have only one valid next position. In general it is an arbitrary-arity tree.

This maze is solveable, so will eventually reach 4, 4. Yay!

```
(define M4  
  (list 0 0 0 0 0  
        0 W W W 0  
        0 W 0 0 0  
        0 W 0 W W  
        W W 0 0 0))
```



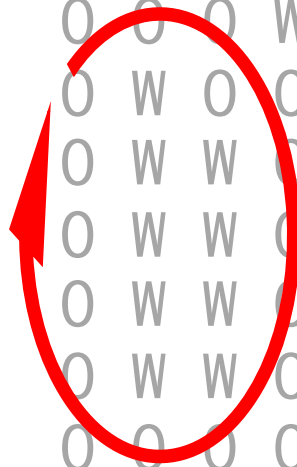
must move left



```
(define M7
  (list 0 0 0 0 0 0 0 0 0 0
        W W 0 W W 0 W W W 0
        0 0 0 W W 0 W 0 0 0
        0 W 0 0 W 0 W 0 W W
        0 W W 0 W 0 W 0 0 0
        0 W W 0 W 0 W W W 0
        0 W W 0 W 0 W 0 0 0
        0 W W 0 0 0 W 0 W W
        0 0 0 0 W W W 0 0 0
        W W W W W 0 0 W W 0)))
```

```
(define M7
  (list 0 0 0 0 0 0 0 0 0 0
        W W 0 W W 0 W W W 0
        0 0 0 W W 0 W 0 0 0
        0 W 0 0 W 0 W 0 W W
        0 W W 0 W 0 W 0 0 0
        0 W W 0 W 0 W W W 0
        0 W W 0 W 0 W 0 0 0
        0 W W 0 0 0 W 0 W W
        0 0 0 0 W W W 0 0 0
        W W W W W 0 0 W W 0)))
```

cycle



keep path accumulator

detect fail when detect cycle

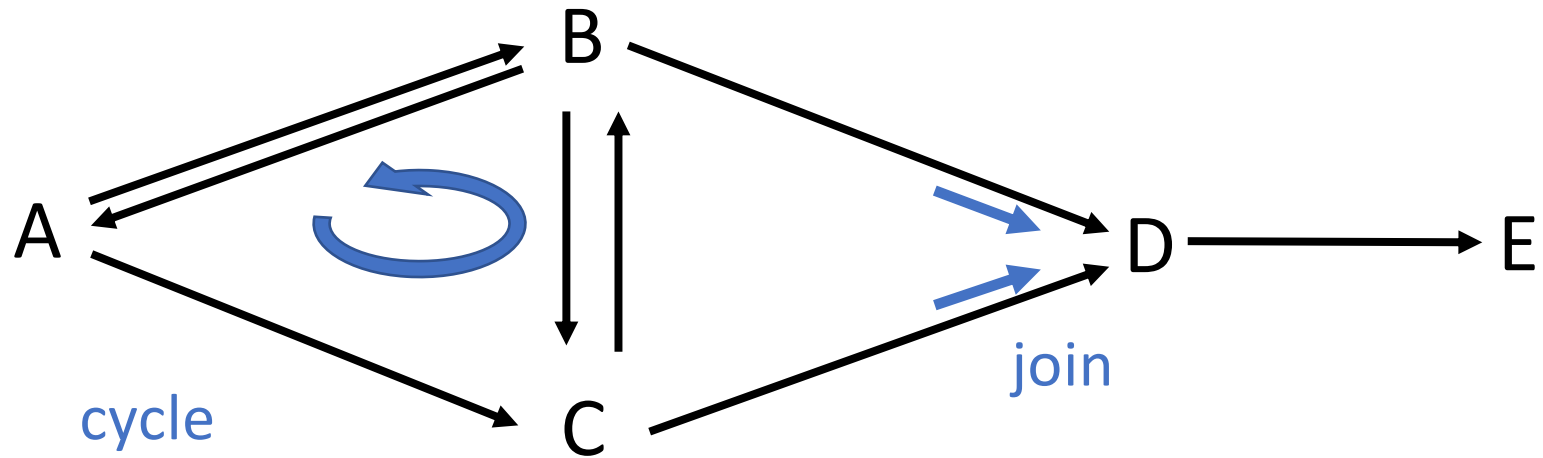
```

(define M7
  (list
    0 0 0 0 0 0 0 0 0 0
    W W 0 W W 0 W W W 0
    0 0 0 W W 0 W 0 0 0
    0 W 0 W 0 W 0 W 0 W
    0 W W 0 W 0 W 0 0 0
    0 W W 0 W 0 W W W 0
    0 W W 0 W 0 W 0 0 0
    0 W W 0 W 0 W 0 W W
    0 0 0 0 0 0 0 0 0
    W W W W ) 0 0
    W W 0))

```

The diagram illustrates a path through a 10x10 matrix. The path starts at the top-left '0' (row 1, column 1) and follows a series of horizontal and vertical steps. It moves right to column 6, then down to row 8, and finally left to column 4. A red arrow points from the 'join' label to the '0' at row 8, column 4.

Directed Graphs



5 maze functions in 2 days

result	Non-functional requirement	sr/tr	path?	visited?	tandem WLS
true or false	must terminate	sr	Y	n/a	n/a
true or false	visit each pos only once	tr	N	Y	N
first path	large mazes				
shortest path	large mazes				
shortest path length	large mazes				