

Homework 2 – Stacks and Queues

TA: Patty (s221274155@gmail.com)
Deadline: 2018 Oct.23, 11:59pm

- Title: Rats in a maze
- Objective
 - Implement a stack function
 - Use a structure type to solve this problem
- Descriptions
 - Read maze.txt to build a maze for two rats at the entrances, respectively. (Figure 1)
 - Maze was constructed by 15 * 15 matrices. Zeros represent the open path and ones are barriers.
 - There are four directions (right, left, down, up) that mice can choose as illustrated in Figure 2. However, not every position can be entered. However, not every position can be moved, if it is a barrier or is out of boundary.

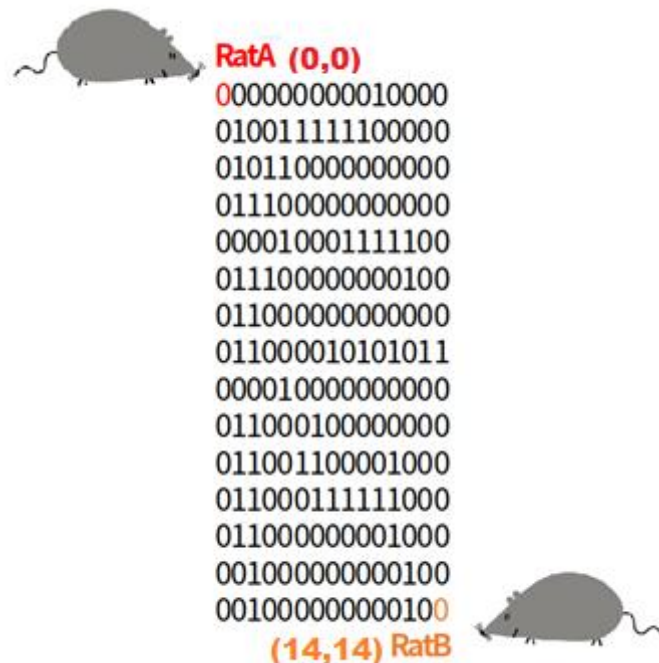


Figure 1

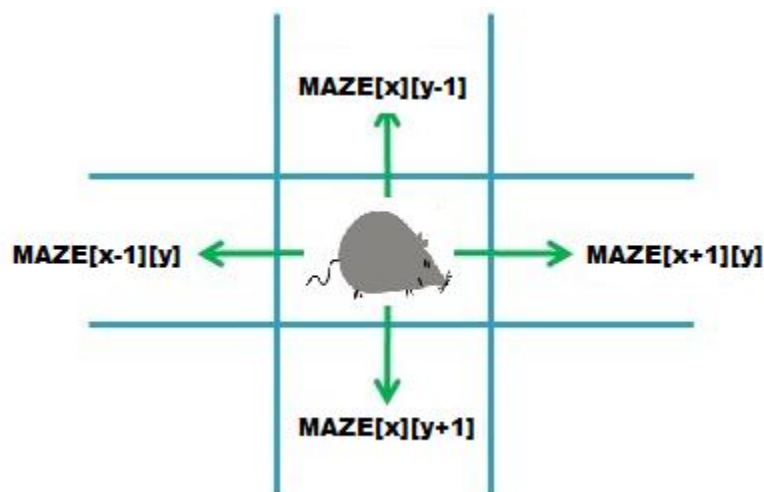


Figure 2

- The start of rat A is at (0, 0), the destination is at (14, 14) and the other rat B starts at (14, 14) and ends at (0, 0). (the vertical axis is the y axis, the horizontal axis is the x axis)
- You must use a stack in your implementation.
- Either rat A or rat B must follow this direction sequence when walking:
 - Rat A: **Right > Down > Up > Left**
 - Rat B: **Left > Up > Down > Right**
- You must output a result.txt including a full path.

e.g. result.txt

```
ratA(0,0)
ratB(14,14)
ratA(0,1)
ratB(14,13)
ratA(0,2)
ratB(13,13)
ratA(0,3)
ratB(12,13)
ratA(0,4)
ratB(12,12)
ratA(0,5)
ratB(11,12)
ratA(0,6)
ratB(10,12)
ratA(0,7)
ratB(9,12)
ratA(0,8)
ratB(9,11)
ratA(0,9)
ratB(9,10)
ratA(0,8)
ratB(9,9)
ratA(0,7)
ratB(9,8)
ratA(0,6)
```

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- Read maze.txt from your project folder and output result.txt into the same folder.
- Grade policies
 - 5% - Source code can be compiled without any error
 - 15% - readme file, code style, and comments in source code
 - To keep source code maintainable and readable, you should add English comments to your source code where reasonable. For this assignment, please also compose a small “README.txt” which contains a brief explanation of how to compile your program and what problem you met.
 - 80% - result correctness (result.txt)
- Turn in
 - System
 - To submit your files electronically, enter the following command from the csie workstation: turnin DS_I_2018.hw2 [your files...]
 - To check the files you turnin, enter the following command from the csie workstation: turnin -ls DS_I_2018

- You can see other description about turnin from following link:
<https://www.cs.ccu.edu.tw/lab401/doku.php?id=turninhowto>
- This source code will be compiled and tested on the workstation
- Source code
 - Source code with appropriate comments
- Report
 - A document named “readme.txt”. You should describe the details of your project in your readme file