Week 8
Stack and Queue

Stack in Python 3 can be implemented as a list. S = []
Push operation is appending to the stack list : S.append(x)
The top of the stack is S[len(S)-1]
Pop operation is deleting the last element of the stack list : del S[len(S)-1]

Workshop: Solve this problem. https://dmoj.ca/problem/postfix

1) Create a user account at the website https://dmoj.ca. You need it for submitting your code.

2) Study the supplemented document (PostFixTutorial.pdf) up to page 15 for the method to solve this problem.

Queue in Python 3 can be implemented as a list. Q = []
Enqueue operation is appending to the queue list : Q.append(x)
The front of the queue is Q[0]
Dequeue operation is deleting the first element of the queue list : del Q[0]

Workshop: Shortest Path in Maze

Given an obstacle in an otherwise empty room, what is the shortest path around it?

Each input is a 10 by 10 character matrix. The character representations are as follows:

- `.` - empty space
- `#` - wall
- `X` - one of the ends

The output will be an integer distance between the two points marked with X.

There will always be only two X spots per set. There will always be a valid path. Valid steps are into any adjacent empty space; *diagonal steps are illegal*.

Sample input

```
..........
..........
..........
....#.....
....#.....
X...#...X.
....#.....
....#.....
..........
..........
```

Sample output

14

3) Modify the provided program to solve this problem.

4) Test your program with the provided three test cases.

   The correct answers are maze_1.in : 12, maze_2.in : 23, maze_3.in : 26