Programming Competition Test

Duration: 2 hours Total Marks: 100

Instructions

1. Use Java. IntelliJ and other common IDEs are available on the provided systems.
2. Write the most efficient solution you can. Solutions have been profiled for optimal performance, and suboptimal solutions risk being timed out.
3. Open and log ito PC^2 early.
4. Use fast IO, testcases can be up to 1 GB in size.

Problem 6(.7): Six Seven

Difficulty: Easy

You are given a string S composed of only the characters '6', '7', 'A', 'B', and '#' (without the quotation marks). This string is processed from left to right, and you must maintain a sequence of chracters that changes according to these rules:

- 6 - add a 6 to the end of the sequence
- 7 - if the sequence is non-empty and its last chracter is '6', remove that last '6', otherwise, add '7' to the end of the sequence
- A - reverse the sequence
- B - add a duplicate of the current sequence to the end of it
- # - clear the sequence

Input format:

- The first line consists of the string S. The string consists only of the characters 6, 7, A, B, and #.

Output format:

- Output a single line containig the final form of the sequence. If the sequence is empty at the end, output "EMPTY" (without the quotations).

Example(s):

```
Input 1:
67A6

Output 1:
6

Input 2:
66B7

Output 2:
666

Input 3:
7A7#

Output 3:
EMPTY
```

Problem 7: Limited Jumps

Difficulty: Medium

You are given a grid of size N x M, where each cell contains either 6 or 7. You start at the top-left corner (1,1) and want to reach the bottom-right corner (N,M). You can move right, down, or jump diagonally (right+down). The maze has these rules:

- You can step on a 6 any number of times
- You can step on a 7 at most once in your path
- You can make at most one diagonal move in your path

Your task is to determine if there exists any valid path from (1,1) to (N,M) obeying the rules.

Input format:

- The first line consists 2 integers N and M ($1 \leq N, M \leq 10^9$), the number of rows and columns, respectively
- The next N lines will consist of strings of length M, containing 6 or 7

Output format:

- Output a single line. If there exists a valid path, print "Sixxx sevennn" (without the quotations). If there does not exist a valid path, print "Six was afraid of seven after all" (without the quotations).

Example(s):

```
Input 1:
2 2
66
67

Output 1:
Sixxx sevennn

Input 2:
2 2
77
77

Output 2:
Six was afraid of seven after all

Input 3:
3 3
666
676
666

Output 3:
Sixxx sevennn
```