Assignment 2: Queue

~ 10/14 11:59 PM

Notification

The task should be done by yourself, and you can't use codes from Internet or anyone else. If you don't follow this rule, we will give you 0 score and there can be other disadvantages.

Exam Guide

1. **This test will be conducted in Groom and scoring results will not be released until 10/7.**
2. **A perfect score is 100 points**
3. **Each question will be scored with multiple test cases and scored based on the number of passed test cases.**
4. **Please keep the submission deadline.**

Problem Lists

Problem 1. 40 pts

Problem 2. 60 pts

Problem 1

Pop-a-point pencil

Score: 40pts

Pop-a-point pencil is a writing instrument for kindergarten and elementary school students.

1. You can attach new pencil piece backward of the pencil
2. You remove front piece to use another color.
3. The length of the pencil cannot exceed ***k***. Otherwise, it will break in the middle.
4. There should be at least one pencil piece.

➢ Input

- The first line contains two integers n and k, the number of queries and maximum length of pencil
  - 0< n, k <10000
- The second line contains string s, initial state of the pencil. Leftmost character is front piece.
  - 0 < |S| < k
  - All character in the string is lowercase alphabet.
- Following n lines gives query in following format:
  - 0 : print the color of front piece
  - 1 : remove the front piece. When only one piece left, ignore the query
  - 2 x : attach new piece x backward. When pencil has n pieces, ignore the query
    - x is a single lowercase alphabet

➢ Output

- when query 0 is given, print the color of front piece

Sample Input 1	Sample Output 1
5 3 abc 0 1 0 1 0	a b c

Sample Input 2	Sample Output 2
12 3 a 1 0 2 b 2 c 2 d 0 1 0 1 0 1 0	a a b c c

Hint :

Sample Input 2	Query	Current pencil state
12 3		
a		
1	(cannot remove)	a
0	**(print)**	a
2 b	(attach b)	ab
2 c	(attach c)	abc
2 d	(cannot attach)	abc
0	**(print)**	abc
1	(remove a)	bc
0	**(print)**	bc
1	(remove b)	c
0	**(print)**	c
1	(cannot remove)	c
0	**(print)**	c

Problem 2

Amusement park

Score: 60pts

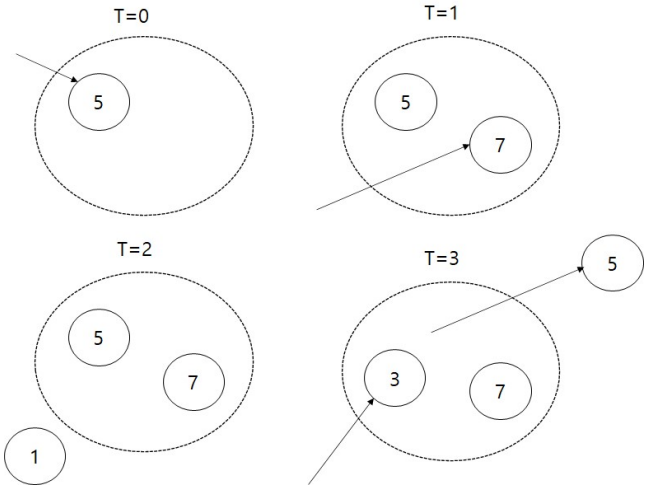
This holiday, many people came to the amusement park. Every minute, new team arrives to the entrance and tries to enter. However, because of COVID-19, The number of people in the park should not exceed C, and people can stay only t minutes. So, you should decide if each team can enter the park or not.

- **Input**
  - The first line contains 3 integers **n, C**, and **t** the number of queries, capacity of the park, and time people can stay in the park.
    - 0< n,C,T < 1000
  - Next line gives n integers x_i (0< i < n), number of people in the team arrived at time i.

- **Output**
  - Print 1 if team can enter. Otherwise, print 0

Sample Input 1	Sample Output 1
4 12 3 5 7 1 3	1 1 0 1

Hint



At time 0, new team with 5 people arrives. They enter to the park

At time 1, new team with 5 people arrives. They enter to the park

At time 2, new team with 1 people arrives. They can't enter to the park
(already 12 people in the park)

At time 3, team with 5 people leaves and simultaneously team with 3 people arrives. They enter to the park

- This is the last page. Good luck ☺ -