

2022 Canadian Computing Olympiad  
Day 2, Problem 3  
**Good Game**

**Time Limit: 1 second**

**Problem Description**

Finn is playing a game of Twos and Threes. Twos and Threes is a one-player game played on a one-dimensional board. In the starting position, there are  $N$  blocks arranged in a row, with each block labelled either  $A$  or  $B$ . Blocks are numbered from 1 to  $N$  from left to right. Finn is allowed to make moves of the following form:

- Select 2 or 3 consecutive blocks that share the same label. Remove them from the board. Connect any remaining blocks together. Re-index the blocks from left to right starting with index 1.

Finn wins the game if all blocks are removed from the board. Your task is to help Finn determine a winning sequence of moves, or determine if the game cannot be won.

**Input Specification**

The first line of input will contain the integer  $N$ .

The second line of input will contain the string  $S$  which is the starting position of the game. There are  $N$  characters in  $S$ , and each of these characters in  $S$  is either  $A$  or  $B$ .

Marks Awarded	Bounds on $N$
3 marks	$1 \leq N \leq 15$
6 marks	$1 \leq N \leq 300$
7 marks	$1 \leq N \leq 6000$
9 marks	$1 \leq N \leq 10^6$

**Output Specification**

If there is a winning sequence of moves, output  $K$ , the number of moves in the winning sequence. On each of the next  $K$  lines, print an index  $i$ , followed by one space, followed by a number  $j$ , denoting a move that will remove the blocks currently at indices  $i$  to  $i + j - 1$ , inclusive.

If there is no winning sequence of moves, output  $-1$ .

If there are multiple winning sequences, then any winning sequence will be accepted. There is no need to minimize or maximize  $K$ .

### Sample Input

9

ABAABBBAA

### Possible Output for Sample Input

4

6 2

3 2

2 2

1 3

### Explanation of Output for Sample Input

The sample output denotes this winning sequence:

*ABAABBBAA*

*ABAABAA*

*ABBAA*

*AAA*