Question 1

You're given a string s. k friends play a game. Player 1 starts the game, then player 2, up until player k and then it's player 1's turn again.
At their turn, a player can take 2 consecutive equal characters from the string and remove them both. For eg. if you have paabc, you can remove aa and the string becomes pbc.
The player who can't make a move loses.
Find the player who loses the game.

string size <= 2e5, k <= 1e6.

Question 2

Given a perfect binary tree of n nodes, all edges have some weights given by the cost array. The weights are given in an order such that the weight of the edge between node x and its parent [x / 2] is cost[x - 2].

In one move, we can increase the weight of any edge by 1.

Find the min number of moves you can make such that the path from the root to any leaf has the same total weight.

n <= 1e17 - 1, weights <= 1e9

Question 3

A string is good if it contains ≤ 2 distinct letters.
Given a string s and a number k, you're allowed to change the character at atmost k positions of the string.

Find the length of the largest good substring of s you can have with at most k changes.

length of string <= 2e5, k <= n, string consists of only lowercase letters