A string S consisting of N characters is considered to be *properly nested* if any of the following conditions is true:

* S is empty;
* S has the form "(U)" or "[U]" or "{U}" where U is a properly nested string;
* S has the form "VW" where V and W are properly nested strings.

For example, the string "{[()()]}" is properly nested but "([)()]" is not.

Write a function:

int solution(string &S);

that, given a string S consisting of N characters, returns 1 if S is properly nested and 0 otherwise.

For example, given S = "{[()()]}", the function should return 1 and given S = "([)()]", the function should return 0, as explained above.

Write an **efficient** algorithm for the following assumptions:

* N is an integer within the range [0..200,000];
* string S consists only of the following characters: "(", "{", "[", "]", "}" and/or ")".