Mock ZCO #2

A. Return of Socho?!

1 second, 256 megabytes

Socho is returning to Singapore after dominating the CS courses at Carnegie Mellon University. As a welcoming gift, Leo is giving Socho a string s consisting of n characters. Leo tells Socho he can perform the following operation on the string.

Choose any substring $s_i s_{i+1} \ldots s_{j-1} s_j$ and reverse it. ($1 \leq i \leq j \leq n$)

Socho wants to test the students at the UFDS Mentoring Program. So he in turn, asks the students, how many distinct strings can he obtain after performing the operation **atmost once**?

Formally, given a string $s_1 s_2 s_3 \ldots s_n$, find the number of distinct strings possible after reversing **atmost one** subarray of it.

Input
The only line of input consists the string s.

$1 \leq |s| \leq 2 \times 10^5$

s consists of lowercase English letters.

$|s|$ denotes the length of the string s.

Output
Output the number of distinct strings possible after reversing atmost one subarray of s.

Scoring
The input is divided into multiple subtasks. You will get the points for a subtask if you solve all the testcases for a subtask correctly within the time limit.

- Subtask 1 [22 points]: $1 \leq |s| \leq 70$

- Subtask 2 [14 points]: $1 \leq |s| \leq 300$

- Subtask 3 [24 points]: $1 \leq |s| \leq 2000$

- Subtask 4 [17 points]: The string consists only of the letter a.

- Subtask 5 [23 points]: Original Constraints

input
socho
output
10

input
nbaisntbetterthanpl
output
160

For the first sample case, the different strings possible are:

- cosho: substring soc was chosen.
- hcoso: substring soch was chosen.
- ohcos: substring socho was chosen.
- oscho: substring so was chosen.
- scoho: substring oc was chosen.
- shcoo: substring och was chosen.
- socho: no substring was chosen.
- socoh: substring ho was chosen.
- sohco: substring ocho was chosen.
- soohc: substring cho was chosen.

Note that there are other substrings that could be chosen but the strings formed by reversing them repeat so we have not included them.

B. Team Work

3 seconds, 256 megabytes

Nishuz wants to choose **three people** from N candidates to form a team.

Each candidate has five parameters: discipline, focus, technique, knowledge, and communication. The discipline, focus, technique, knowledge, and communication of the i^{th} candidate are A_i, B_i, C_i, D_i, E_i respectively.

Let us define your team's discipline as the maximum of the members' discipline. The team's focus, technique, knowledge, and communication are defined similarly. Then, let us define your team's total strength as the minimum of the team's discipline, focus, technique, knowledge, and communication.

Nishuz is busy preparing to get AIR-1 in IITJEE so he asks you to solve the following task: find the **maximum possible** value of your team's total strength.

Input
The first line of input is N - the number of candidates.

The next N lines contain 5 integers each - A_i, B_i, C_i, D_i, E_i.

$3 \leq N \leq 10^5$

$1 \leq A_i, B_i, C_i, D_i, E_i \leq 10^9$

Output
Output the **maximum possible** value of your team's total strength.

Scoring
The input is divided into multiple subtasks. You will get the points for a subtask if you solve all the testcases for a subtask correctly within the time limit.

- Subtask 1 [14 points]: $N = 3$
- Subtask 2 [32 points]: $3 \leq N \leq 100$
- Subtask 3 [15 points]: $3 \leq N \leq 3000$ and $1 \leq A_i, B_i, C_i, D_i, E_i \leq 400$
- Subtask 4 [27 points]: $3 \leq N \leq 3000$
- Subtask 5 [12 points]: Original Constraints

input
3 3 9 6 4 6 6 9 3 1 1 8 8 9 3 7
output
4

input
5 6 13 6 19 11 4 4 12 11 18 20 7 19 2 5 15 5 12 20 7 8 7 6 18 5
output
13

input
10 6 7 5 18 2 3 8 1 6 3 7 2 8 7 7 6 3 3 4 7 12 8 9 15 9 9 8 6 1 10 12 9 7 8 2 10 3 17 4 10 3 1 3 19 3 3 14 7 13 1

output
10

For sample input 1, we have no choice but to choose all three of them. Then, the team's parameters will be as follows:

- discipline: $\max(3, 6, 8) = 8$;
- focus: $\max(9, 9, 8) = 9$;
- technique: $\max(6, 3, 9) = 9$;
- knowledge: $\max(4, 1, 3) = 4$;
- communication: $\max(6, 1, 7) = 7$.

Thus, the team's total strength will be $\min(8, 9, 9, 4, 7) = 4$.
For the second sample input, if we choose the 1^{st}, 2^{nd}, and 3^{rd} candidates, the team's total strength will be $\min(20, 13, 19, 19, 18) = 13$ which is the maximum possible.