Islamic University of Technology
Department of Computer Science and Engineering

Lab 8

CSE 4404: Algorithms Lab
Summer 2023-24

Task A. Longest Nice Substring

Time Limit: 1 second | Memory Limit: 512 MB

A string s is **nice** if, for every letter of the alphabet that s contains, it appears **both** in uppercase and lowercase. For example, "`aAa`" is nice because both "`A`" and "`a`" appear, but "`abA`" is not because "`b`" appears but "`B`" does not.

Given a string s, return the **longest** substring of s that is nice. If there are multiple, return the substring that occurs first in the input string.

Input Format

The input will contain a single line containing string with both uppercase and lowercase alphabets.

Output Format

Print one string: representing the maximum nice substring.

Constraints

- $1 \leq$ `s.length` ≤ 100
- s consists of uppercase and lowercase English letters.

Examples

Sample Input	Sample Output
`YazaAay`	`aAa`
`Bb`	`Bb`
`c`	

NB: You must use a divide and conquer approach

Task B. Minimum Euclidean Distance

Time Limit: 1 second | *Memory Limit: 512 MB*

You are given n points on a 2D plane. What is the minimum distance between two points?

Input Format

The first input line contains an integer n: the number of points. After this, there are n lines that describe the points. Each line has two integers x and y: the coordinates of a point. All points are distinct.

Output Format

Print one integer: the minimum distance squared between two points.

Constraints

- $2 \leq n \leq 2 \cdot 10^5$
- $-10^9 \leq x, y \leq 10^9$

Examples

Sample Input	Sample Output
4 0 0 5 5 3 4 1 1	2

NB: You must use a divide and conquer approach