C. Large String Finding

time limit per test: 2 s
memory limit per test: 256 MB

For a given string, find the lexicographically largest substring of every prefix and output its left and right index. If there are many occurrences of the same substring, output the leftmost one.

Input

The only line contains a string T $(1 \leq |T| \leq 10^6)$, which consists of lowercase letters, a to z.

Output

Output $|T|$ lines. The i-th line should contain two integers l_i and r_i, representing the answer for the prefix of length i.

Examples

input Copy

```
potato
```

output Copy

```
1 1
1 2
3 3
3 4
3 5
5 6
```

input Copy

```
pbpbppb
```

output Copy

```
1 1
1 2
1 3
1 4
1 5
5 6
5 7
```

UIUC CS 491 Spring 2025

Private

Participant

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Group website

→ Group Contests

- Line Sweep - Homework (Extra Credit)
- Convex Hull - Preclass
- Number Theory I - Homework
- Line Sweep - Preclass
- Number Theory II - Homework
- Combinatorics - Homework
- Geometry - Preclass
- Geometry - Homework
- Convex Hull - Homework (Extra Credit)
- Rabin Karp - Homework
- Number Theory II - Preclass
- Combinatorics - Preclass
- DP TSP - Homework
- KMP - Homework
- DP Tree - Homework
- Number Theory I - Preclass
- KMP - Preclass
- DP Palindromes - Homework
- Rabin Karp - Preclass
- DP Edit Distance - Homework
- DP Knapsack - Homework
- DP TSP - Preclass
- DP Longest Increasing Subsequence - Homework
- DP Intro - Homework
- DP Tree - Preclass
- Greedy - Homework
- Fenwick Tree - Homework