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1.  /* Given a string S of Lower-case Latin Letters(a-z), |S| <= 100000.
2.  Find the the Longest contiguous palindromic substring of S.
3.  If there are several such strings you should output the first of them. */
4.  #include<bits/stdc++.h>
5.  using namespace std;
6.  #define ll long long
7.  const int MAXN = 100005;
8.  struct Node{
9.      int nxt[52];
10.     int val;
11.     int length, suffixLink;
12.     int startPos, endPos;
13. };
14. struct PalTree{
15.     Node tree[MAXN];
16.     Node root1, root2;
17.     int ptr, curNode;
18.     char s[MAXN];
19.
20.     void init(){
21.         root1.length = -1, root1.suffixLink = 1;
22.         root2.length = 0, root2.suffixLink = 1;
23.         tree[1] = root1, tree[2] = root2;
24.         ptr = curNode = 2;
25.     }
26.
27.     void addLetter(int pos){
28.         int ch;
29.         if(s[pos]>='A'&&s[pos]<='Z') ch = s[pos]-'A';
30.         else ch = s[pos]-'a'+26;
31.         int cur = curNode;
32.
33.         while(true){
34.             int curLength = tree[cur].length;
35.             if(pos-1-curLength >= 0 && s[pos-1-curLength] == s[pos])break;
36.             cur = tree[cur].suffixLink;
37.         }
38.
39.         if(tree[cur].nxt[ch] != 0){
40.             curNode = tree[cur].nxt[ch];
41.             tree[curNode].val++;
42.             return;
43.         }
44.
45.         ptr++;
46.         curNode = ptr;
47.         tree[cur].nxt[ch] = curNode;
48.         tree[curNode].length = tree[cur].length + 2;
49.         tree[curNode].startPos = pos - tree[curNode].length + 1;
50.         tree[curNode].endPos = pos;
51.
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52.         if(tree[curNode].length == 1){
53.             tree[curNode].suffixLink = 2;
54.             tree[curNode].val = 1;
55.             return;
56.         }
57.
58.         while(true){
59.             cur = tree[cur].suffixLink;
60.             int curLength = tree[cur].length;
61.             if(pos-1-curLength >= 0 && s[pos-1-curLength] == s[pos]){
62.                 tree[curNode].suffixLink = tree[cur].nxt[ch];
63.                 break;
64.             }
65.         }
66.
67.         tree[curNode].suffixLink = tree[cur].nxt[ch];
68.         tree[curNode].val = 1;
69.         return;
70.     }
71.
72.     void getResult(){
73.         int maxx = 0;
74.         int Start = 0, End = 0;
75.         for(int i=3; i<=ptr; i++){
76.             if(tree[i].length>maxx){
77.                 maxx = tree[i].length;
78.                 Start = tree[i].startPos;
79.                 End = tree[i].endPos;
80.             }
81.         }
82.
83.         for(int i=Start; i<=End; i++) printf("%c",s[i]);
84.
85.         printf("\n");
86.     }
87.
88.     void Clear(){
89.         for(int i=0; i<=ptr; i++){
90.             memset(tree[i].nxt, 0, sizeof(tree[i].nxt));
91.         }
92.     }
93. };
94. PalTree Pt;
95. int main(){
96.     scanf("%s",&Pt.s);
97.     int n = strlen(Pt.s);
98.     Pt.init();
99.     for(int i=0; i<n; i++) Pt.addLetter(i);
100.    Pt.getResult();
101.    return 0;
102. }
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