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1 //KMP Algorithm for pattern match in a string
2 //Time complexity = O(m+n) ----- m=length of pattern, n=length of text
3
4 #include<bits/stdc++.h>
5 using namespace std;
6 void KMP(string ,string); //function for KMP that takes two parameters of String type
7 first
8 void computeLPSarray(string,int [],int);
9 int main()
10 {
11     string text = "ABABDABACDABABCABAB";
12     string pattern = "ABABCABAB";
13     KMP(text,pattern);
14     return 0;
15 }
16 void computeLPSarray(string pattern,int lps[],int m)
17 {
18     int i=1,len=0;
19     lps[0]=0; //Initially lps[0] = 0 always
20     while(i<m)
21     {
22         if(pattern[len]==pattern[i])
23         {
24             len++;
25             lps[i]=len;
26             i++;
27         }
28         else
29         {
30             if(len>0)
31             {
32                 len=lps[len-1];
33             }
34             else
35             {
36                 lps[i]=0; //Because of not matched and len reached to 0 so lps[i] will
37                             be zero
38                 i++; //increase i by 1 to match next
39             }
40         }
41     }
42 }
43 void KMP(string text,string pattern)
44 {
45     int n=text.length();
46     int m=pattern.length();
47     int i=0,j=0;
48     int lps[m]; //LPS array to stores lps of pattern
49     computeLPSarray(pattern,lps,m); //Compute the LPS array
50     while(i<n)
51     {
52         if(text[i]==pattern[j])
53         {
54             i++;
55             j++;
56         }
57         if(j==m)
58         {
59             cout<<"Pattern matched at indexed start from "<<i-j<<endl;
60             j=lps[j-1];
61         }
62         else if(i<n && pattern[j]!=text[i])
63         {
64             if(j!=0)
65             {
66                 j=lps[j-1];
67             }

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68         else
69         {
70             i++;
71         }
72     }
73 }
74 }
75
```