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4 LIVE EVENTS

Cyclic Permutations

Attempted by: **3** / Accuracy: **100%** / ★★★★★

Tag(s): Algorithms, KMP, Medium, Z-algorithm

PROBLEM EDITORIAL MY SUBMISSIONS ANALYTICS

GE- Co-orporation.

IS THIS EDITORIAL HELPFUL?

Yes, it's helpful

No, it's not helpful

Author Solution by Lalit Kundu

```
def KMP(text, pattern, n):
    ans=0
    pattern = list(pattern)
    shifts = [1] * (len(pattern) + 1)
    shift = 1
    for pos in range(len(pattern)):
        while shift <= pos and pattern[pos] != pattern[pos-shift]:
            shift += shifts[pos-shift]
        shifts[pos+1] = shift
    startPos = 0
    matchLen = 0
    for c in text:
        while matchLen == len(pattern) or \
              matchLen >= 0 and pattern[matchLen] != c:
            startPos += shifts[matchLen]
            matchLen -= shifts[matchLen]
        matchLen += 1
        if matchLen == len(pattern) and startPos<n:
            ans += 1
    return ans
t=input()
while t:
    a=raw_input()
    b=raw_input()
    b += b
    print KMP(b,a,len(a))
    t-=1
```

Tester Solution

```
#include <bits/stdc++.h>
using namespace std;

const int NN = 212345;

int fail[2][NN];
bool valid[2][NN];

void build(string tmp,int tc){
    int n = (int)tmp.size();
    int k = fail[tc][0] = 0;

    for(int i = 1; i < n; ++i){
        while(k > 0 and tmp[k] != tmp[i])
            k = fail[tc][k-1];
        k += (tmp[k] == tmp[i]);
        fail[tc][i] = k;
    }

    while(k > 0){
        valid[tc][n-k] = true;
        k = fail[tc][k-1];
    }
}

void solve(){
    string s1,s2;
    cin >> s1 >> s2;

    memset(valid,false,sizeof(valid));
    build(s1+s2,0);
    build(s2+s1,1);

    int ans = 0;
    int n = (int)s2.size();
    int m = (int)s1.size();

       assert(n >= 1 and n <= 100000);
       assert(m >= 1 and m <= 100000);

    for(int i = 0; i < n; ++i){
        if (valid[0][m+i]){
            if (i == 0 or valid[1][n+n-i])
                ++ans;
        }
    }

    cout << ans << "\n";
}
```

```

int main()
{
    int t;
    cin >> t;
    while(t--)
        solve();
    return 0;
}
```

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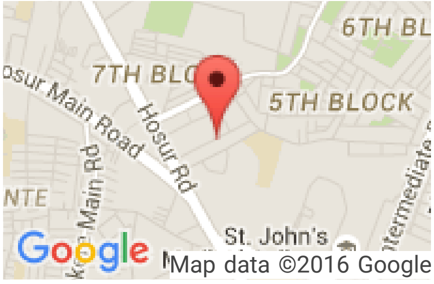

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