

DAA
CSE2012
LAB-08

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String matching Naive approach

Code:

```
#include <bits/stdc++.h>
using namespace std;
void search(char* pat, char* txt)
{
    int M = strlen(pat);
    int N = strlen(txt);
    for (int i = 0; i <= N - M; i++) {
        int j;
        for (j = 0; j < M; j++)
            if (txt[i + j] != pat[j])
                break;
        if (j == M)
            cout << "Pattern found at index "
                << i << endl;
    }
}
int main()
{
    char txt[] = "AABAACAADAABAAABAA";
    char pat[] = "AABA";
    search(pat, txt);
    return 0;
}
```

Output:

```
cd "e:\Coding\C++\DAA_LABS\LAB08\" ; i-
mpCodeRunnerFile }
The longest common subsequence is: 1
1
PS E:\Coding\C++\DAA_LABS\LAB06> 
```

Knuth Morris Pratt Pattern Searching

Code:

```
#include <bits/stdc++.h>
void computeLPSArray(char* pat, int M, int* lps);
void KMPSearch(char* pat, char* txt)
{
    int M = strlen(pat);
    int N = strlen(txt);
    int lps[M];
    computeLPSArray(pat, M, lps);
    int i = 0; // index for txt[]
    int j = 0; // index for pat[]
    while (i < N) {
        if (pat[j] == txt[i]) {
            j++;
            i++;
        }
        if (j == M) {
            printf("Pattern found at index %d ", i - j);
            j = lps[j - 1];
        }
        else if (i < N && pat[j] != txt[i]) {
            if (j != 0)
                j = lps[j - 1];
            else
                i = i + 1;
        }
    }
}
void computeLPSArray(char* pat, int M, int* lps)
{
    int len = 0;
    lps[0] = 0;
```

```

int i = 1;
while (i < M) {
    if (pat[i] == pat[len]) {
        len++;
        lps[i] = len;
        i++;
    }
    else
    {
        if (len != 0) {
            len = lps[len - 1];
        }
        else
        {
            lps[i] = 0;
            i++;
        }
    }
}

int main()
{
    char txt[] = "ABABDABACDABABCABAB";
    char pat[] = "ABABCABAB";
    KMPSearch(pat, txt);
    return 0;
}

```

Output:

```

PS E:\Coding\C++\DAA_LABS\LAB06> cd "e:\Co
2 }
Pattern found at index 10
PS E:\Coding\C++\DAA_LABS\LAB08> 

```