Text = HAUNSHANHAEHUNEHHASEUNHHENUSENNHUSHENEUSHAHUSNEHAU

Pattern = HANHA

HANHA, Length = m = 5

Code :

#include <iostream>

#include <string>

using namespace std;

void preKmp(string x, int m, int kmpNext[]){

int i, j;

i = 0;

j = kmpNext[0] = -1;

while(i < m){

while (j > -1 && x[i] != x[j]){

j = kmpNext[j];

}

i++;

j++;

if (x[i] == x[j]){

kmpNext[i] = kmpNext[j];

}

else{

kmpNext[i]=j;

}

}

}

void KMP(string x, int m, string y, int n){

int i, j, kmpNext[m];

preKmp(x, m, kmpNext);

cout << "Tabel kmpNext : "<<endl;

for(int a = 0; a < m; a++){

cout << kmpNext[a]<<"";

}

cout<<endl<<endl;

i = j = 0;

while(j < n){

while(i > -1 && x[i] != y[j]){

i = kmpNext[i];

}

i++;

j++;

if(i >= m){

cout << "Ditemukan di index : "<< (j - i)<<endl;

i = kmpNext[i];

}

else if(i < m && j == n){

cout << endl;

cout << "Data tidak ditemukan";

}

}

}

int main(){

string text;

string pattern;

cout << "Masukkan kata/kalimat :";

getline(cin, text);

cout << endl;

cout << "Masukkan kata/kalimat yang mau dicari : ";

getline(cin, pattern);

cout << endl;

KMP(pattern, pattern.length(), text, text.length());

Return 0;

}

Ditentukan kmpnext pada index 0 adalah -1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| H | A | N | H | A |
| -1 | 0 |  |  |  |

Ditentukan kmpnext pada index 1 adalah 0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| H | A | N | H | A |
| -1 | 0 |  |  |  |

Ditentukan kmpnext pada index 2 adalah 0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| H | A | N | H | A |
| -1 | 0 | 0 |  |  |

Ditentukan kmpnext pada index 3 adalah -1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| H | A | N | H | A |
| -1 | 0 | 0 | -1 |  |

Ditentukan kmpnext pada index 4 adalah 0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| H | A | N | H | A |  |
| -1 | 0 | 0 | -1 | 0 | 1 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U |  | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
| H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Untuk proses pencarian kita akan membandingkan 1 per 1 tiap huruf

Melakukan Pencarian

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
| H | A | N |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 2 sehingga digeser sebanyak

i-KmpNext[i] = 2 – 0 = 2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Karena Pattern ditemukan, maka posisi ditemukannya Pattern adalah 6

Geser = i – KmpNext[i] = 6 -1 = 5 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 1 sehingga digeser sebanyak

i – KmpNext[i] = 1 – (0) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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Salah pada index ke 1 sehingga digeser sebanyak

i – KmpNext[i] = 1 – 0 = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 3 sehingga digeser sebanyak

i – KmpNext[i] = 3 – (-1) = 4 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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Salah pada index ke 1 sehingga digeser sebanyak

i – KmpNext[i] = 1 – 0 = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 1 sehingga digeser sebanyak

i – KmpNext[i] = 1-0 = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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Salah pada index ke 1 sehingga digeser sebanyak

i – KmpNext[i] = 1 – 0 = 1 kotak

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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Salah pada index ke 1 sehingga digeser sebanyak

i – KmpNext[i] = 1 – 0 = 1 kotak

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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Salah pada index ke 0 sehingga digeser sebanyak

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Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

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Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
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Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |  |  |  |  |

Salah pada index ke 3 sehingga digeser sebanyak

i – KmpNext[i] = 3 – (-1) = 4 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |  |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |

Salah pada index ke 0 sehingga digeser sebanyak

i – KmpNext[i] = 0 – (-1) = 1 kotak

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| H | A | U | N | S | H | A | N | H | A | E | H | U | N | E | H | H | A | S | E | U | N | H | H | E | N | U | S | E | N | N | H | U | S | H | E | N | E | U | S | H | A | H | U | S | N | E | H | A | U |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | A | N | H | A |

Sudah Melebihi banyak kata sehingga pencarian berhenti

Sehingga didapatkan pattern HANHA pada kata diatas sebanyak 1 kali pada index ke 6