# JARIWALA SAHIL Y.

# ROLL NO: 057

# SUBJECT: AA

# LAB : 1

# AIM: IMPLEMENT ALGORITHM FOR STRING MATCHING
## 1. BRUTE FORCE
## 2. HORSPOOL'S

# 1. BRUTE FORCE APPROACH

## CODE:

```cpp
1. #include<bits/stdc++.h>
2. using namespace std;
3.
4. //Brute Force method For String matching
5. void BF_String_match(string str, string pattern){
6.     cout<<"Pattern match at index:";
7.     int s_len, p_len;
8.     s_len = str.length();
9.     p_len = pattern.length();
10.         //traverse whole string
11.         for(int s=0; s<=s_len-p_len; s++){
12.             int i=0, j=0;
13.             //equate string by char and run for pattern length
14.             while(j<p_len && str[s+i] == pattern[j]){
15.                 i++;
16.                 j++;
17.             }
18.              //if j is equal to pattern length means pattern match occuered
19.             if(j == p_len){
20.                 cout<<s<<" ";
21.             }
22.         }
23.         cout<<endl<<"-------------------------------------------------------------------"<<endl;
24.     }
25.     int main(){
26.         int n;
27.         string temp;
28.         cin>>n;
29.         getline (cin, temp);
30.         while(n--){
31.             string str, pattern;
```

```
32.              cout << "entre String: ";
33.              getline (cin, str);
34.              cout<<endl;
35.              cout << "entre Pattern: ";
36.              getline (cin, pattern);
37.              cout<<endl;
38.              BF_String_match(str, pattern);
39.          }
40.      }
```

# OUTPUT:

```
sahiljariwala@sahiljsy:~/Desktop/SEM_5/AA/LAB$ g++ brute-force.cpp
sahiljariwala@sahiljsy:~/Desktop/SEM_5/AA/LAB$ ./a.out
5
entre String: abababababaaaba

entre Pattern: ba

Pattern match at index:1 3 5 7 11
-----------------------------------------------------------
entre String: abacdferxcxabc

entre Pattern: c

Pattern match at index:3 9 13
-----------------------------------------------------------
entre String: jariwala sahil yogeshkumar

entre Pattern: kumar

Pattern match at index:21
-----------------------------------------------------------
entre String: cdefhsdnnnmsdfaeracx

entre Pattern: cfgh

Pattern match at index:
-----------------------------------------------------------
entre String: JIM_SAW_ME_IN_A_BARBER_SHOP

entre Pattern: _

Pattern match at index:3 7 10 13 15 22
-----------------------------------------------------------
sahiljariwala@sahiljsy:~/Desktop/SEM_5/AA/LAB$ 
```

# 2.HORSPOOL'S:

**CODE:**

```
1. #include<bits/stdc++.h>
2. #define SIZE 256
3. using namespace std;
4.
5. //case sensative
6. void horspool(string str, string pattern){
7.     int j, i, shift[SIZE];
8.     int s_len = str.length();
9.     int p_len = pattern.length();
10.        //initlize shift array with length of pattern
11.        for (i = 0; i < SIZE; ++i)
12.          shift[i] = p_len;
13.          //update char distance in shift which are present in pattern
    string
14.        //count distance of char from last char of pattern
15.        for (i = 0; i < p_len - 1; i++){
16.            shift[pattern[i]] = p_len - i - 1;
17.        }
18.
19.        cout<<"Pattern match at index:";
20.
21.        j=0;
22.        //traverse string
23.        while(j+p_len <= s_len){
24.            //start equating char from last char of pattern
25.            if(pattern[p_len-1] == str[j+ p_len -1]){
26.                //if last char matched then try to matched pattern
27.                int i = p_len-2;
28.                while(i>=0 && pattern[i] == str[i+j]){
29.                    i--;
30.                }
31.                //i =-1 means pattern matched
32.                if(i ==-1){
```

```cpp
33.                  cout<<j<<" ";
34.               }
35.            }
36.          //shift the pattern according to value stored in shift array
37.          j = j+ shift[str[j+p_len-1]];
38.        }
39.        cout<<endl<<"-----------------------------------------------------
   -----------------"<<endl;
40.      }
41.    int main(){
42.          int n;
43.          string temp;
44.          cin>>n;
45.          getline (cin, temp);
46.          while(n--){
47.              string str, pattern;
48.              cout << "entre String: ";
49.              getline (cin, str);
50.              cout<<endl;
51.              cout << "entre Pattern: ";
52.              getline (cin, pattern);
53.              cout<<endl;
54.              horspool(str, pattern);
55.          }
56.      }
```

# OUTPUT:

```
sahiljariwala@sahiljsy:~/Desktop/SEM_5/AA/LAB$ g++ horspool.cpp
sahiljariwala@sahiljsy:~/Desktop/SEM_5/AA/LAB$ ./a.out
5
entre String: ababababaaaba

entre Pattern: ba

Pattern match at index:1 3 5 7 11
................................................................
entre String: this is random text dude is

entre Pattern: is

Pattern match at index:2 5 25
................................................................
entre String: cdsfgfagartadfvdbdf

entre Pattern: f

Pattern match at index:3 5 13 18
................................................................
entre String: JARiwala sahil yogeshkumar

entre Pattern: jar

Pattern match at index:
................................................................
entre String: abcabcabcabcccc

entre Pattern: bca

Pattern match at index:1 4 7
................................................................
sahiljariwala@sahiljsy:~/Desktop/SEM_5/AA/LAB$
```