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CSE DS D1

DAA exp 10

Aim: String Matching algorithms (To implement Robin Karp algorithm)

Code:

```
#include <stdio.h>
#include <string.h>

// d is the number of characters in the input alphabet
#define d 256

void search(char pat[], char txt[], int q)
{
    int M = strlen(pat);
    int N = strlen(txt);
    int i, j;
    int p = 0; // hash value for pattern
    int t = 0; // hash value for txt
    int h = 1;

    // The value of h would be "pow(d, M-1)%q"
    for (i = 0; i < M - 1; i++)
        h = (h * d) % q;

    for (i = 0; i < M; i++) {
        p = (d * p + pat[i]) % q;
        t = (d * t + txt[i]) % q;
    }

    // Slide the pattern over text one by one
    for (i = 0; i <= N - M; i++) {

        if (p == t) {
            /* Check for characters one by one */
            for (j = 0; j < M; j++) {
                if (txt[i + j] != pat[j])
                    break;
            }

            // if p == t and pat[0...M-1] = txt[i, i+1,
```

```

        // ...i+M-1]
        if (j == M)
            printf("Pattern found at index %d \n", i);
    }

    if (i < N - M) {
        t = (d * (t - txt[i] * h) + txt[i + M]) % q;

        // We might get negative value of t, converting
        // it to positive
        if (t < 0)
            t = (t + q);
    }
}

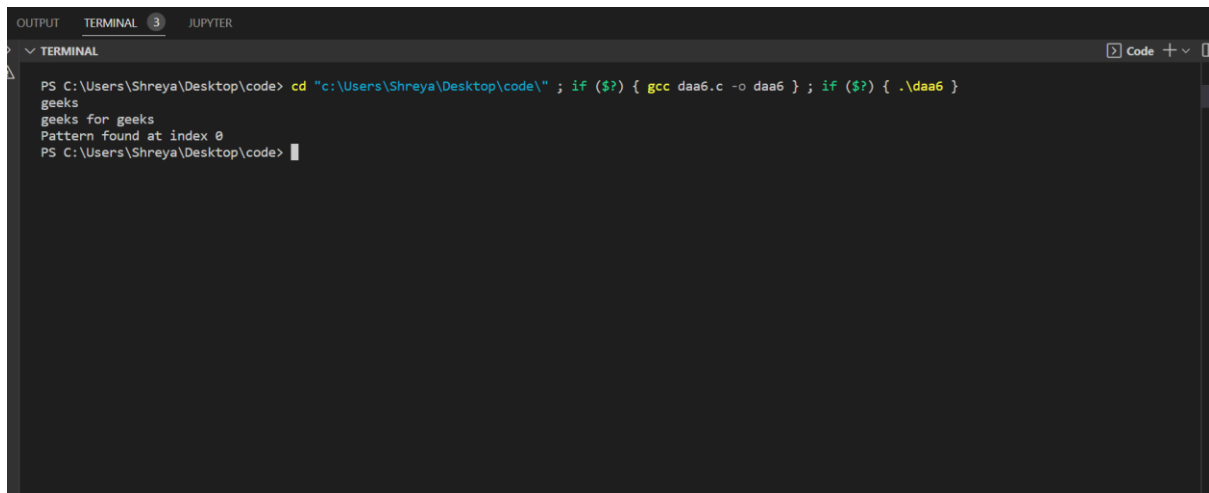
/* Driver Code */
int main()
{
    char txt[10];
    char pat[10];
    scanf("%s %s", txt, pat);

    int q = 101;

    // function call
    search(pat, txt, q);
    return 0;
}

```

Output:



The screenshot shows a Jupyter Notebook interface with a terminal window open. The terminal displays the following commands and output:

```
PS C:\Users\Shreya\Desktop\code> cd "c:\Users\Shreya\Desktop\code" ; if ($?) { gcc daa6.c -o daa6 } ; if ($?) { .\daa6 }
geeks
geeks for geeks
Pattern found at index 0
PS C:\Users\Shreya\Desktop\code>
```

The terminal window has tabs for OUTPUT, TERMINAL (active), and JUPYTER. A 'Code' button is visible in the top right corner of the terminal pane.

Conclusion : In this experiment I understood Rabin karp algorithm.