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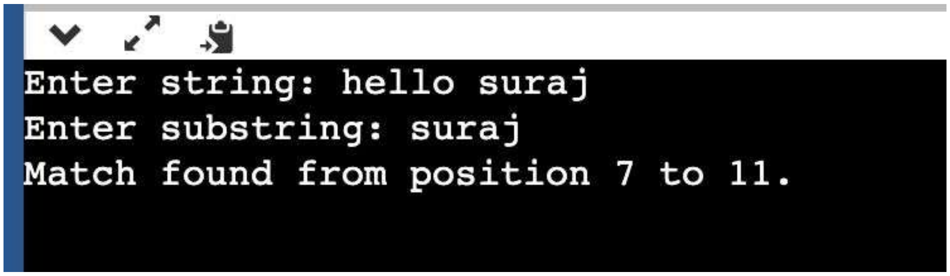
Assignment - 14

1. Write a c program to implement string matching algorithm (Using KMP algorithm)

Code:

```
#include <stdio.h>
#include <string.h>
#include <ctype.h> int
main()
{
char string[100], matchcase[20], c; int i
= 0, j = 0, index; printf(”Enter string:
”);
do
{
fflush(stdin); c
= getchar();
string[i++] = tolower(c);
} while (c != '¥n');
string[i - 1] = '¥0';
printf(”Enter substring: ”); i =
0;
do
{
fflush(stdin); c
= getchar();
matchcase[i++] = tolower(c);
} while (c != '¥n');
matchcase[i - 1] = '¥0';
for (i = 0; i < strlen(string) - strlen(matchcase) + 1; i++)
{
index = i;
do
{
i++;
j++;
} while (j != strlen(matchcase) && string[i] == matchcase[j]); if (j ==
strlen(matchcase))
{
printf("Match found from position %d to %d.¥n", index + 1, i); return 0;
}
else
{
i = index + 1; j
= 0;
}
}
}
printf("No substring match found in the string.¥n"); return 0;
}
```

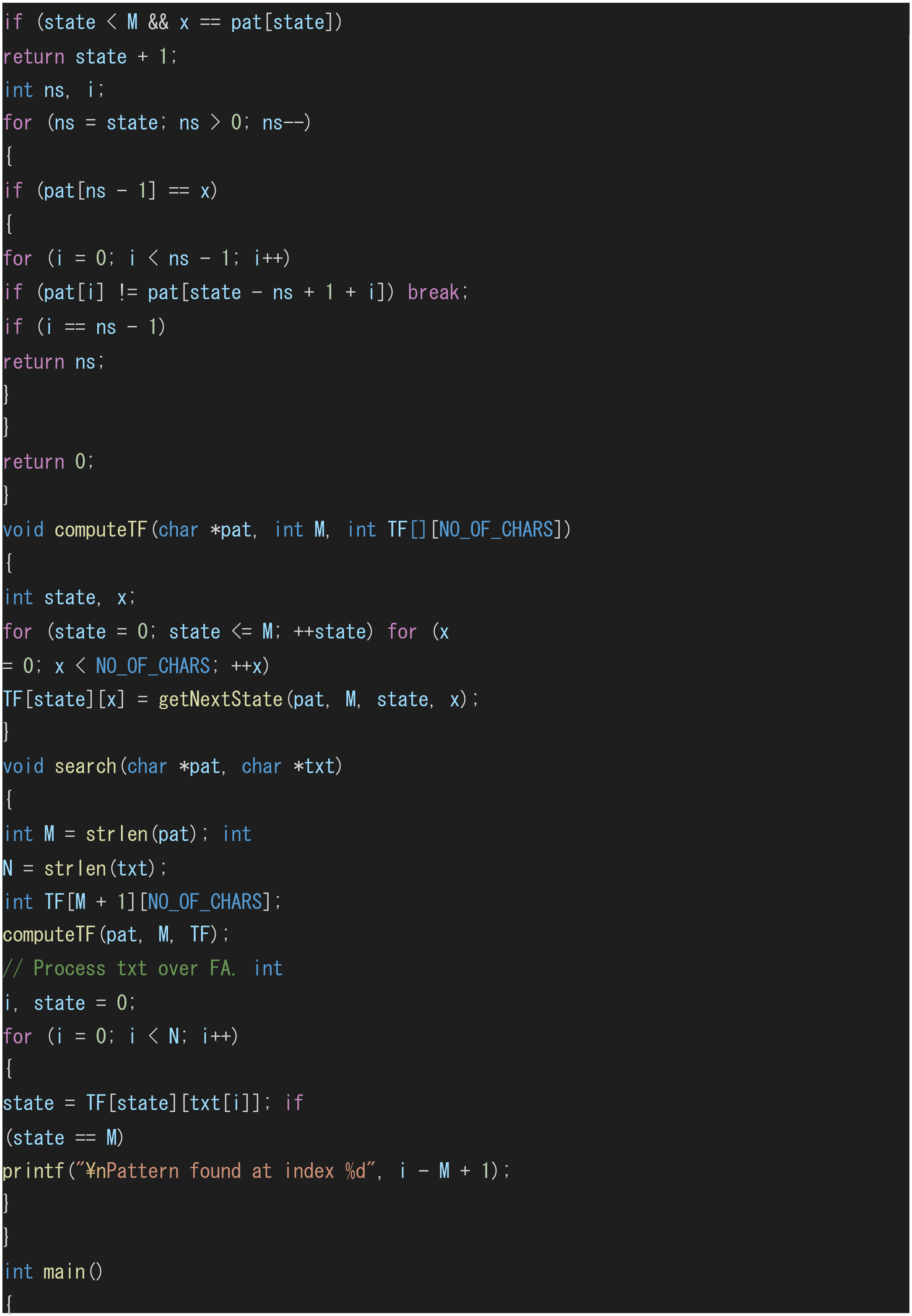


```
Enter string: hello suraj
Enter substring: suraj
Match found from position 7 to 11.
```

2. Write a c program to implement string matching algorithm (Using Finite Automata)

Code:

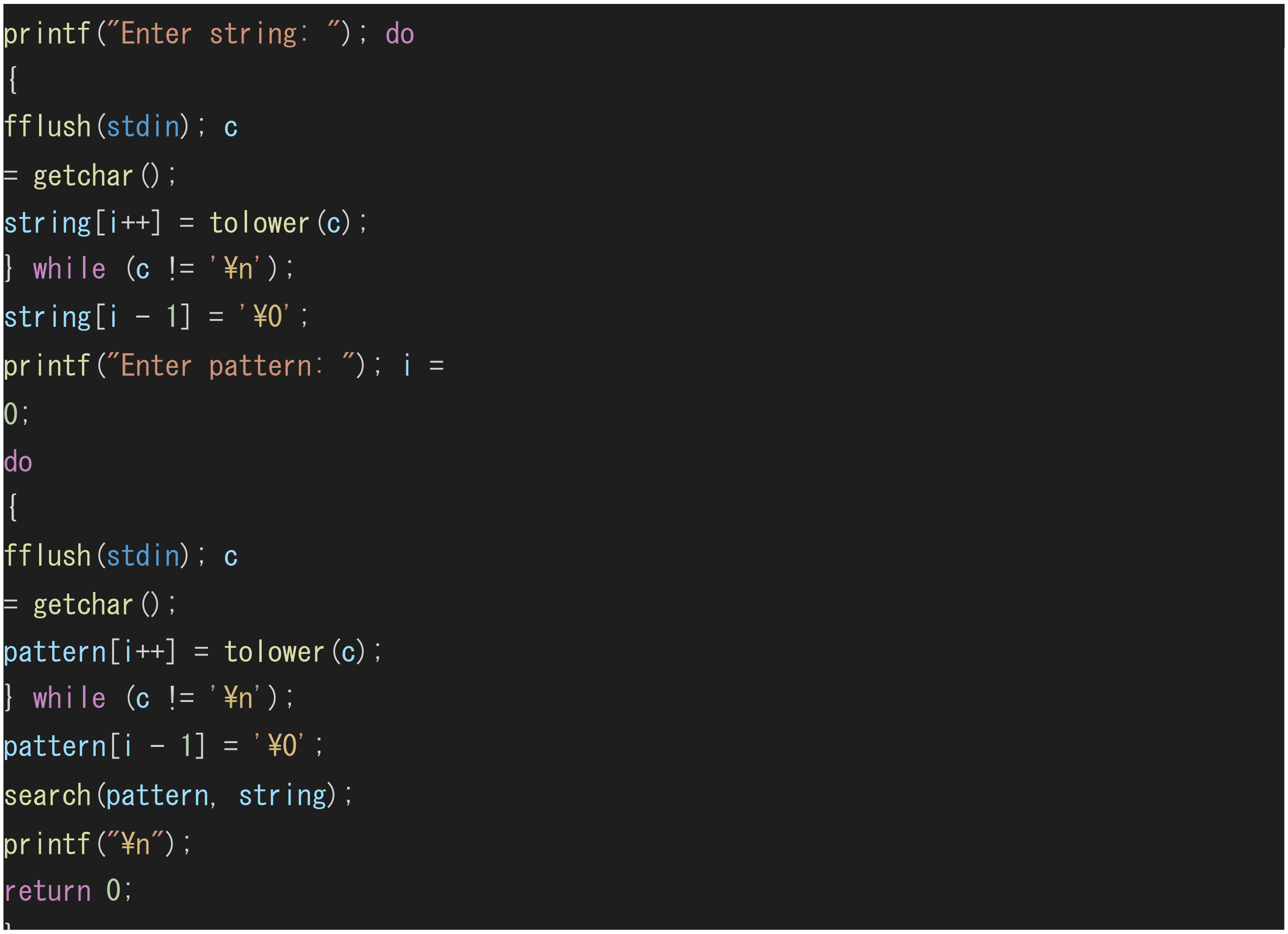
```
#include <stdio.h> #include
<string.h> #include
<ctype.h> #define
NO_OF_CHARS 256
int getNextState(char *pat, int M, int state, int x)
{
```



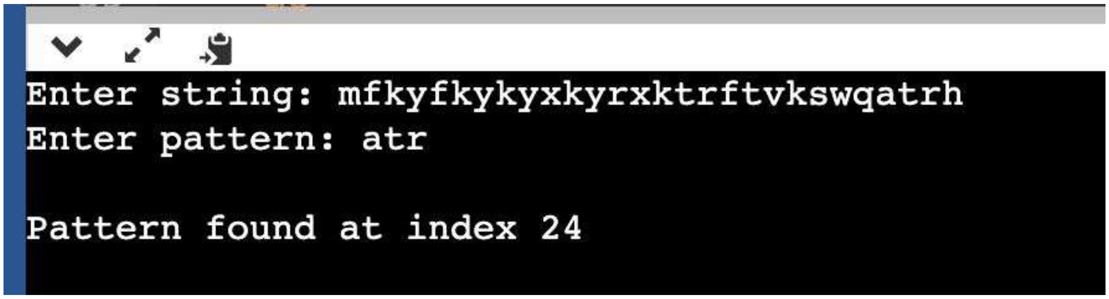
```
if (state < M && x == pat[state])
return state + 1;
int ns, i;
for (ns = state; ns > 0; ns--)
{
if (pat[ns - 1] == x)
{
for (i = 0; i < ns - 1; i++)
if (pat[i] != pat[state - ns + 1 + i]) break;
if (i == ns - 1)
return ns;
}
}
return 0;
}
void computeTF(char *pat, int M, int TF[][NO_OF_CHARS])
{
int state, x;
for (state = 0; state <= M; ++state) for (x
= 0; x < NO_OF_CHARS; ++x)
TF[state][x] = getNextState(pat, M, state, x);
}
void search(char *pat, char *txt)
{
int M = strlen(pat); int
N = strlen(txt);
int TF[M + 1][NO_OF_CHARS];
computeTF(pat, M, TF);
// Process txt over FA. int
i, state = 0;
for (i = 0; i < N; i++)
{
state = TF[state][txt[i]]; if
(state == M)
printf(″¥nPattern found at index %d″, i - M + 1);
}
}
int main()
{
```

```
char string[100], pattern[20], c; int i
```

```
= 0;
```



```
printf("Enter string: "); do
{
fflush(stdin); c
= getchar();
string[i++] = tolower(c);
} while (c != '¥n');
string[i - 1] = '¥0';
printf("Enter pattern: "); i =
0;
do
{
fflush(stdin); c
= getchar();
pattern[i++] = tolower(c);
} while (c != '¥n');
pattern[i - 1] = '¥0';
search(pattern, string);
printf("¥n");
return 0;
}
```



```
Enter string: mfkyfkykyxkyrxktrftvkswqatrh
Enter pattern: atr

Pattern found at index 24
```