

Write a shell script and C program to perform the following string operations:

- a) To extract a substring from a given string.

```
GNU nano 6.2 exp5a.sh
echo "String: WE welcome you in operating system Lab."
str="We welcome you in Operating system Lab."
substr="${str:0:10}"
substr2="${str:-3:4}"
substr3="${str:10:24}"
echo -e "\nExtracting the subtring from index 0 upto index 10: $substr\n"

echo -e "\nExtracting the substring from index -3 upto index 4: $substr2\n"

echo -e "\nExtracting the substring from index 10 upto index 24: $substr3\n"
```

```
GNU nano 6.2 exp5a.c
#include <stdio.h>
void main()
{
char str[100], sstr[100];
int pos, l, c = 0;

printf("\n\nExtract a substring from a giving string:\n");
printf("-----\n");

printf("Input the string : ");
fgets(str, sizeof str, stdin);

printf("Input the position to start extraction :");
scanf("%d", &pos);

printf("Input the length of substring :");
scanf("%d", &l);

while (c < l)
{
sstr[c] = str[pos+c-1];
c++;
}
sstr[c] = '\0';

printf("The substring retrieve from the string is : \" %s\n\n", sstr);
}
```

b) To find the length of a given string.

```
GNU nano 6.2 exp5b.sh
str="Welcome to CSE Dep"
n=${#str}
echo "Length of the string is : $n "
```

```
GNU nano 6.2 exp5b.c
// c program to find the length of string
#include <stdio.h>
#include <string.h>

int main()
{
    char str[1000];
    int i;

    printf("Enter the string: ");
    scanf("%s", str);

    for (i = 0; str[i] != '\0'; ++i);

    printf("Length of string is %d", i);
    return 0;
}
```

→ Compare the running time of above shell script and C program using the time command.

a)

```
sayeum@sayeum:~/new/hello$ time ./exp5a.sh
String: WE welcome you in operating system Lab.

Extracting the substring from index 0 upto index 10: We welcome

Extracting the substring from index -3 upto index 4: We welcome you in Operating system Lab.

Extracting the substring from index 10 upto index 24: you in Operating system

real    0m0.027s
user    0m0.000s
sys     0m0.013s
sayeum@sayeum:~/new/hello$ gcc exp5a.c
sayeum@sayeum:~/new/hello$ time ./a.out

Extract a substring from a giving string:
-----
Input the string : sayeum
Input the position to start extraction :1
Input the length of substring :3
The substring retrieve from the string is : " say

real    0m31.520s
user    0m0.000s
sys     0m0.004s
```

b)

```
sayeum@sayeum:~/new/hello$ time ./exp5b.sh
Length of the string is : 18

real    0m0.004s
user    0m0.001s
sys     0m0.004s
sayeum@sayeum:~/new/hello$ gcc exp5b.c
sayeum@sayeum:~/new/hello$ time ./a.out
Enter the string: sayeum
Length of string is 6
real    0m6.255s
user    0m0.003s
sys     0m0.000s
sayeum@sayeum:~/new/hello$
```