

LAB_5

Apply Functions and Recursions to simple programs.

a) Write a C program to perform swapping using function.

Algorithm: 1. Start the program

2. Declare and get the two integer variables a and b.

3. call the swap () function 3.1 In swap definition use the temporary variable and assign temp =a 3.2 a=b 3.3 b=temp

4. Print the a and b value.

5. Display the result

6. Stop the program.

Program:

// Online C compiler to run C program online

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

```
// #include
```

```
void swap(int a,int b);//function declaration
```

```
// void swap(int ,int );
```

```
void main() {
```

```
int a,b,r;
```

```
//clrscr();
```

```
printf("enter value for a&b: ");
```

```
scanf("%d%d",&a,&b);
```

```
swap(a,b);
```

```
//getch();
```

```
}
```

```
void swap(int a,int b)
```

```
{
```

```
int temp;
```

```
temp=a;
```

```
a=b;
```

```
b=temp;
printf("after swapping the value for a & b is : %d %d",a,b);
}
```

Result: Thus the C program to perform swapping using function has been successfully executed

b) Write a C program to find fibonacci series using recursion

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

```
// fibonacci() function definition
```

```
int fibonacci(int num)
```

```
{
```

```
    // first base condition check
```

```
    if (num == 0)
```

```
    {
```

```
        return 0; // returning 0, if condition meets
```

```
    }
```

```
    // second base condition check
```

```
    else if (num == 1)
```

```
    {
```

```
        return 1; // returning 1, if condition meets
```

```
    }
```

```
    // else calling the fibonacci() function recursively till we get to the base conditions
```

```
    else
```

```
    {
```

```
        return fibonacci(num - 1) + fibonacci(num - 2); // recursively calling the fibonacci()
function and then adding them
```

```
    }
```

```
}
```

```

int main()
{
    int num; // variable to store how many elements to be displayed in the series
    printf("Enter the number of elements to be in the series : ");
    scanf("%d", &num); // taking user input
    int i;
    for (i = 0; i < num; i++)
    {
        printf("%d, ", fibonacci(i)); // calling fibonacci() function for each iteration and printing
        the returned value
    }

    return 0;
}

```

Output=/tmp/c2gzSVpvua.o

Enter the number of elements to be in the series : 4

0, 1, 1, 2,

c)Write a C program to find Sum of Natural Numbers Using Recursion

// Online C compiler to run C program online

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

```
int addNumbers(int n);
```

```
int main() {
```

```
    int num;
```

```
printf("Enter a positive integer: ");  
scanf("%d", &num);  
printf("Sum = %d", addNumbers(num));  
return 0;  
}
```

```
int addNumbers(int n) {  
    if (n != 0)  
        return n + addNumbers(n - 1);  
    else  
        return n;  
}
```

Output= Enter a positive integer: 3

Sum = 6