Lab 6

1. Write a program to add the first n natural numbers using two separate functions, where:
    a. First function uses iteration
    b. Second function uses recursion.
2. Write a program to calculate the factorial value of any integer, using two functions where:
    a. First function uses iteration
    b. Second function uses recursion.
3. Write a program to print the n^{th} term in the Fibonacci series, where n is the user input, using recursion.
4. Write a program to generate and print the Fibonacci series till the n^{th} term, where n is the user input, using recursion.
5. Write a C program to declare 3 arrays, each of type int, float and char of size 10.
    a. Initialize these arrays with proper values
    b. Print the values in the arrays using loop
    c. Take user input and store these elements in the arrays – use loop. Print them.
    d. Try to access and print the elements at index 20 of each array and see the result.
6. Take user inputs of marks of a student for 6 subjects (each out of 100). Store them in an integer array. Calculate the average marks and print it.
7. Enter 10 numbers from user. Store them in an integer array. Print how many are
    a. Positive, odd
    b. Negative, odd

    c. Positive even
    d. Negative Even
    e. zeros
8. Take user input of 5 integers in an array A. Copy contents of A into another integer array B:
    a. In the same order
    b. In the reverse order.
9. Take as user input two integer arrays A and B of size 5. Print if they are equal or not.
10. Take as use input two character arrays of same size 10 which are unequal. Find and print the array indices where they are unequal.
11. Write a program in C to convert a decimal number to binary using recursion.
12. Write a program in C to check if a number is a prime number or not using recursion.
13. Write a program in C to find the LCM of two numbers using recursion.
14. Write a program in C to calculate the power of any integer number raised to another integer using recursion.

Example Problem 1 for recursion:

```c
#include <stdio.h>
int sum_n(int n){ //recursive function
    if(n==1){
        return 1;
    }
    else{
        return (n+sum_n(n-1)); //recursive function call
    }
}
int main() {
    int x = 10;
    int r = sum_n(x);
    printf("Result = %d",r);
    return 0;
}
```

Example Problem 2:

```c
#include <stdio.h>
int rec_fact(int z){
    printf("\n-----Function rec_fact is called-----");
    if(z==0){
        printf("\nz = %d is equal to 0",z);
        return 1;
    }
    else{
        printf("\nz = %d is not equal to 0, so doing recursive
            call",z);
        return (z*rec_fact(z-1));
    }
}
```

```c
int main() {
    int n, r;
    printf("Enter number: ");
    scanf("%d",&n);
    r = rec_fact(n);
    printf("\nFactorial of %d = %d ",n,r);
    return 0;
}
```