21. Write a c program to find factorial number using function and recursion.

Ans: Function Input:

#include <stdio.h>

fact(int n) {

fact = 1;

For (int i = 1; i <= n; i++) {

Fact =fact \* i;

}

Return fact;

}

Int main() {

Int num;

Printf(“Enter a number: “);

Scanf(“%d”, &num);

If (num < 0) {

Printf(“Factorial of %d is : %2d\n”, num, fact(num));

}

Return 0;

}

Output:

Enter a number: 5

Factorial of 5 is : 120

Recursion Input:

#include<stdio.h>

Int fact(n);

Int main()

{

Int n,a;

Printf(“Enter a no:”);

Scanf(“%d”,&n);

a = fact(n);

Printf(“The factorial of %d is : %d”, n,a);

Return 0;

}

Int fact(n)

{

If(n <= 1)

Return 1;

Else

Return n\*fact(n-1);

}

Output:

Enter a no: 5

The factorial of 5 is: 120

22. Write a c program to find Fibonacci Series using function and recursion.

Ans: Function Input:

#include <stdio.h>

Void fibonacci(int n) {

Int a = 0, b = 1, s;

Printf(“Fibonacci Series: “);

For (int i = 0; i < n; i++) {

Printf(“%d “, a);

s = a + b;

a = b;

b = s;

}

Printf(“\n”);

}

Int main() {

Int num;

Printf(“Enter the no of terms: “);

Scanf(“%d”, &num);

If (num <= 0) {

Fibonacci(num);

}

Return 0;

}

Output:

Enter the no of terms: 7

Fibonacci series: 0112358

Recursion Input:

#include<stdio.h>

Int fibonacci(int n)

{

If(n <= 1)

{

Return n;

}

Else

{

Return fibonacci (n-1)+fibonacci (n-2);

}

Int main()

{

Int n,i;

Printf(“Enter the no of terms:”);

Scanf(“%d”,&n);

Printf(“Fibonacci series:”);

For(i = 0; i < n; i++)

{

Printf(“%d”, fibonacci (i));

}

Return 0;

}

Output:

Enter the no of terms: 7

Fibonacci series: 0112358

23. Write a c program to GCD of 2nos using recursion.

Ans: Input:

#include <stdio.h>

Int gcd(int a, int b) {

If (b == 0)

Return a;

Return gcd(b, a % b);

}

Int main() {

Int num1, num2;

Printf(“Enter 2 nos: “);

Scanf(“%d %d”, &num1, &num2);

Printf(“GCD of %d and %d is %d\n”, num1, num2, gcd(num1, num2));

Return 0;

}

Output:

Enter 2 nos: 56, 98

GCD of 56 and 98 is : 14

24. Write a c program of swapping 2nos using call by value and call by reference.

Ans: Call by value Input:

#include <stdio.h>

Void swap(int a, int b) {

Int c = a;

a = b;

b = c;

Printf(“Inside function: a = %d, b = %d\n”, a, b);

}

Int main() {

Int num1, num2;

Printf(“Enter 2 nos:”);

Scanf(“%d %d”, &num1, &num2);

Printf(“After swapping (in main): num1 = %d, num2 = %d\n”, num1, num2);

Return 0;

}

Output:

Enter 2 nos: 5 ,10

Inside function: a=10 , b=5

After swapping (in main) : num = 5, num = 10

Call by reference Input:

#include <stdio.h>

Void swap(int \*a, int \*b) {

Int c = \*a;

\*a = \*b;

\*b = c;

}

Int main() {

Int num1, num2;

Printf(“Enter 2 nos: “);

Scanf(“%d %d”, &num1, &num2);

Printf(“After swapping: num1 = %d, num2 = %d\n”, num1, num2);

Return 0;

}

Output:

Enter 2nos: 10, 5

After swapping: num 1=5, num 2=10