ASSIGNMENT NO:4 **DATE:20/09/2014**

PROGRAM TITLE: Find the factorial of an integer number by using a recursive function. Have the recursive function defined in another file called recursive.c and its corresponding declaration/function prototype in recursive.h header file.

PROGRAM ALGORITHM:

```
algo main()
{
      input n
      if(x is not negative)
      {
            call fact(arguments: n)
            store returned value in x
            print x
      }
      else
      {
            print "Factorial of a negative number does not exist"
      }
}

algo fact(parameters: n)
{
      if(x equal to zero)
            return (one)
      else
            return (n multiplied by call fact(arguments: n minus one))
}
```

PROGRAM CODE:

main.c

```
/* Main program in C to find out Factorial */
#include <stdio.h>
#include "recursive.h"
int main()
{
      int n;
      double x;

      /*Read the input*/
      printf("Enter a number to find its factorial\n");
      scanf("%d",&n);

      /*Check to see if input is negative or not*/
      if(n>=0)
      {
            x=fact(n);
            printf("The factorial is %g\n",x);
```

```
	}
	else
		printf("Factorial of a negative number doesn't exist\n");
	return 0;
}
```

recursive.c

```
/* Recursive function in C to return Factorial of a number */
#include "recursive.h"
double fact(int x)
{
	if(x==0)
		return 1;
	else
		return(x*fact(x-1));
}
```

recursive.h

```
/*C Header file for Factorial function*/
#ifndef FACT_H
#define FACT_H
 double fact(int);
#endif
```

OUTPUT:

Set 1:

```
Enter a number to find its factorial
7
The factorial is 5040
```

Set 2:

```
Enter a number to find its factorial
15
The factorial is 1.30767e+12
```

Set 3:

```
Enter a number to find its factorial
0
The factorial is 1
```

Set 4:

```
Enter a number to find its factorial
-9
Factorial of a negative number doesn't exist
```

DISCUSSION:

The Program works for all integers including negative(Set 4) and zero(Set 3). Files main.c and recursive.c have to be called together to create the final .out file.