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Q. Write a program to find the factorial of a given number.

THEORY

Recursion is the process of repeating items in a self-similar way. In programming languages, if a program allows you to call a function inside the same function, then it is called a recursive call of the function.

Factorial of a number can be found in a similar way. It is a mathematical concept where product of all the natural numbers till the number chosen is taken. Recursion helps in calling the same function again and again where we define the function as a way to multiply the digits accordingly upto an extent.

The C programming language supports recursion, i.e., a function to call itself. But while using recursion, programmers need to be careful to define an exit condition from the function, otherwise it will go into an infinite loop.

ALGORITHM

Step 1: Start
Step 2: Read number n
Step 3: Call factorial(n)
Step 4: Print factorial f
Step 5: Stop

factorial(n)
Step 1: If n==0 then return 0
Step 2: If n==1 then return 1
Step 3: Else f = n*factorial(n-1)
Step 4: Return f

CODE

```
#include<stdio.h>
#include<stdlib.h>       //header files are included
#include<string.h>

int factorial(int);      // user defined function for finding the factorial of the given number

// the main function starts from here
int main()
{
  int n,f;
  printf("enter the number of which we need to find the factorial \n");    //number is asked from user.
  scanf("%d",&n);
  f=factorial(n);    //call the function and store the value in f
  printf("The factorial of %d is %d \n",n,f);   //display the value
  return 0;
```

```
}

//here we define our user defined function
int factorial(int n)
{
  if(n==0)
  {
    return 0;   //return 0 if user chooses 0 as the value of n
  }
  else if(n==1)
  {
    return 1;  //return 1 if user chooses 1 as the value of n
  }
  else
  {
    return n*factorial(n-1);  //we are again calling our function here, this is called recursion
  }
}
//end of program
```