Task4: Number theory-level 1(Includes factorial, Fibonacci series, odd or even...)

Given an integer N. You have to find the number of digits that appear in its factorial, where the factorial is defined as, factorial(N) = 1*2*3*4.....*N and factorial (0)=1.

Aim: To write a program to find factorial of the numbers.

Algorithm:

```
1. Read the integer N.
2. Initialize a variable called factorial to 1.
3. Initialize an array called digits of size 10 to 0.
4. Convert the factorial to a string
5. Count the number of non-zero elements in the
   digits array.
6. end the program.
```

program:

```
#include <stdio.h>
int countDigitsInFactorial(int n);
int main()
{
int n;
```

Output:

```
enter a positive integer: 5
Numbero of digit in 5! = 3
```

```
printf("enter a positive integer:");
scanf("%d",&n);
int count = countDigitsInFactorial(n);
printf("Number of digits in %d! = %d\n",n,count);
return 0;
}
int countDigitsInFactorial(int n)
{
if(n<0)
{
return0;
}
if(n<=1)
{
return1;
}
double digits=0;
for(int i=2;i<=n;i++){
digits+=log10(i);
}
return (int) floor(digits)+1;
}
```

6) Given a number positive number N, find value of $f_0+f_1+f_2+\dots+f_N$ where f_i indicates i'th fibonacci number. Remember that $f_0=0, f_1=1, f_2=1, f_3=2, f_4=3, f_5=5 \dots$

Output:

Input:

N=3

output:

4

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algorithm:

1. Read the positive integer N.
2. Initialize variable f0 and f1 to 0 and 1 respectively
3. Initialize a variable sum to f0.
4. Loop from 1 to N and for each iteration: a. calculate the current fibonacci number fn as f0+f1
5. Return sum modulo 1000000007
6. end the program.

program:

```
#include <stdio.h>
#define MOD 1000000007
int fibonacciSum(int n){
Int prev=0, i<=n; i++){
   sum=(sum+curr)%MOD;
    next=(prev+curr)%MOD;
   prev = curr;
   curr = next;
 }
 return sum;
}
int main( ){
   int N;
   scanf("%d", &N);
   printf("%d\n", fibonacciSum(N));
   return 0;
}
```

Result: Thus the program is executed and verified successfully.

EL TECH - CSE	
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RECORD (4)	
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