**More on Recursion in C Language**

1. ***Write a recursive function to calculate sum of first N natural numbers.***

#include<stdio.h>

int SOFNNum(int);

int main()

{

int N, ans;

printf("Enter Nth number:");

scanf("%d",&N);

printf("Sum of first %d natural numbers:\n",N);

ans=SOFNNum(N);

printf("%d",ans);

return 0;

}

int SOFNNum(int n)

{

int sum=n;

if(n)

sum=sum+SOFNNum(n-1);

return sum;

}

1. ***Write a recursive function to calculate sum of first N odd natural numbers.***

#include<stdio.h>

int sum\_of\_frNatural(int);

int main()

{

int N, ans;

printf("Enter Nth number:");

scanf("%d",&N);

printf("Sum of first %d odd natural numbers:\n",N);

ans=sum\_of\_frNatural(N);

printf("%d",ans);

return 0;

}

int sum\_of\_frNatural(int n)

{

int i=n-1,sum=0;

if(n)

{

sum=n+i;

sum=sum+sum\_of\_frNatural(n-1);

}

return sum;

}

1. ***Write a recursive function to calculate sum of first N even natural numbers.***

#include<stdio.h>

int sum\_of\_frNatural(int);

int main()

{

int N, ans;

printf("Enter Nth number:");

scanf("%d",&N);

printf("Sum of first %d even natural numbers:\n",N);

ans=sum\_of\_frNatural(N);

printf("%d",ans);

return 0;

}

int sum\_of\_frNatural(int n)

{

int sum=0;

if(n)

{

sum=n+n;

sum=sum+sum\_of\_frNatural(n-1);

}

return sum;

}

1. ***Write a recursive function to calculate sum of squares of first n natural numbers.***

#include<stdio.h>

int sum\_of\_frNatural(int);

int main()

{

int N, ans;

printf("Enter Nth number:");

scanf("%d",&N);

printf("Sum of squares of first %d natural numbers\n",N);

ans=sum\_of\_frNatural(N);

printf("%d",ans);

return 0;

}

int sum\_of\_frNatural(int n)

{

int sum=0;

if(n)

{

sum=n\*n;

sum=sum+sum\_of\_frNatural(n-1);

}

return sum;

}

1. ***Write a recursive function to calculate sum of digits of a given number.***

#include<stdio.h>

int sum\_of\_numdigit(int);

int main()

{

int N, ans;

printf("Enter Nth number:");

scanf("%d",&N);

printf("Sum of digits of %d number is:\n",N);

ans=sum\_of\_numdigit(N);

printf("%d",ans);

return 0;

}

int sum\_of\_numdigit(int n)

{

int sum=0;

if(n)

sum=(n%10)+sum\_of\_numdigit(n/10);

return sum;

}

1. ***Write a recursive function to calculate factorial of a given number***

#include<stdio.h>

int fact(int);

int main()

{

int N, ans;

printf("Enter Nth number:");

scanf("%d",&N);

printf("factorial of %d is:\n",N);

ans=fact(N);

printf("%d",ans);

return 0;

}

int fact(int n)

{

int f=1;

if(n)

{

f=n;

f=f\*fact(n-1);

}

return f;

}

1. ***Write a recursive function to calculate HCF of two numbers.***

#include<stdio.h>

int HCF(int,int);

int main()

{

int num1,num2,ans;

printf("Enter two numbers:");

scanf("%d%d",&num1,&num2);

printf("HCF of %d and %d is:\n",num1,num2);

ans=HCF(num1,num2);

printf("%d",ans);

return 0;

}

int HCF(int a,int b)

{

int max=a>b?a:b;

int min=a<b?a:b;

if(max%min!=0)

min=HCF(max%min,min);

return min ;

}

1. ***Write a recursive function to print first N terms of Fibonacci series.***

#include<stdio.h>

int Fibonnaci(int);

int main()

{

int N,i;

printf("Enter a number:");

scanf("%d",&N);

printf("first %d terms of Fibonnaci series:\n",N);

for(i=0; i<N; i++)

{

printf("%d ",Fibonnaci(i));

}

return 0;

}

int Fibonnaci(int n)

{

if(n==0 || n==1)

return n;

return Fibonnaci(n-1)+Fibonnaci(n-2);

}

1. ***Write a program in C to count the digits of a given number using recursion.***

#include<stdio.h>

int count\_digits(int);

int main()

{

int N,i;

printf("Enter a number:");

scanf("%d",&N);

printf("%d digits in %d number:",count\_digits(N),N);

return 0;

}

int count\_digits(int n)

{

int count=0;

if(n)

{

count=1+count\_digits(n/10);

}

return count;

}

1. ***Write a program in C to calculate the power of any number using recursion.***

#include<stdio.h>

int power(int,int);

int main()

{

int N,P;

printf("Enter number and that power:");

scanf("%d%d",&N,&P);

printf("%d is %d power of %d:",power(N,P),P,N);

return 0;

}

int power(int n,int p)

{

int pr;

if(p)

pr=n\*power(n,p-1);

if(p==0)

return 1;

return pr;

}