**Assignment-13**

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

Ans-#include<stdio.h>

int sum(int);

int main()

{

int a;

printf("enter a number");

scanf("%d",&a);

printf("sum of first %d numbers is %d",a,sum(a));

}

int sum(int x)

{

if(x==1)

return x;

return x+sum(x-1);

}

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

Ans-#include<stdio.h>

int sum\_odd(int);

int main()

{

int a;

printf("enter a number");

scanf("%d",&a);

printf("sum of first %d numbers is %d",a,sum\_odd(a));

}

int sum\_odd(int x)

{

if(x>0)

{

return (2\*x-1)+sum\_odd(x-1);

}

}

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

Ans-#include<stdio.h>

int sum\_even(int);

int main()

{

int a;

printf("enter a number");

scanf("%d",&a);

printf("sum of first %d numbers is %d",a,sum\_even(a));

}

int sum\_even(int x)

{

if(x>0)

{

return (2\*x)+sum\_even(x-1);

}

}

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

Ans-#include<stdio.h>

int sum\_square(int);

int main()

{

int a;

printf("enter a number");

scanf("%d",&a);

printf("sum of squares of first %d numbers is %d",a,sum\_square(a));

}

int sum\_square(int x)

{

if(x>0)

{

return (x\*x)+sum\_square(x-1);

}

}

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

Ans-#include<stdio.h>

int sum\_digit(int);

int main()

{

int a;

printf("enter a number");

scanf("%d",&a);

printf("sum of digitsof that %d numbers is %d",a,sum\_digit(a));

}

int sum\_digit(int x)

{

if(x==0)

return 0;

return x%10+sum\_digit(x/10);

}

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

Ans-#include<stdio.h>

int fact(int);

int main()

{

int a;

printf("enter a number");

scanf("%d",&a);

printf("factorial of %d is %d",a,fact(a));

}

int fact(int x)

{

if(x==0)

return 1;

return x\*fact(x-1);

}

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

Ans-#include<stdio.h>

int hcf(int,int);

int main()

{

int a,i,b;

printf("enter a number");

scanf("%d%d",&a,&b);

printf("HCF of %d and %d is %d",a,b,hcf(a,b));

return 0;

}

int hcf(int x,int y)

{

int temp;

if(x<y)

{

temp=x;

x=y;

y=temp;

}

if(x%y==0)

return y;

return hcf(x%y,y);

}

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

Ans-#include<stdio.h>

int fibo(int);

int main()

{

int a,i;

printf("enter a number");

scanf("%d",&a);

printf("%d terms of the fibo nacci series is:\n",a);

for(i=1;i<=a;i++)

{

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

}

}

int fibo(int x)

{

if(x==1||x==2)

{

return 1;

}

return (fibo(x-1)+fibo(x-2));

}

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

Ans-#include<stdio.h>

int count\_digit(int);

int main()

{

int a;

printf("enter a number");

scanf("%d",&a);

printf("factorial of %d is %d",a,count\_digit(a));

}

int count\_digit(int x)

{

int count=0;

if(x==0)

{

return count;

}

count++;

return count+count\_digit(x/10);

}

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

Ans-#include<stdio.h>

float power(float,float);

int main()

{

float a,b;

printf("enter a number");

scanf("%f%f",&a,&b);

printf("%f^%f=%f",a,b,power(a,b));

return 0;

}

float power(float x,float y)

{

if(y>=0)

{

if(y==0)

return 1;

return x\*power(x,y-1);

}

if(y<=0)

{

if(y==0)

return 1;

return (1/x)\*power(x,y+1);

}

}