PRACTICAL- 1

Implement a function for each of following problems and count the number of steps executed/Time taken by each function on various inputs and write complexity of each function. Also draw a comparative chart. In each of the following function N will be passed by user.

1. To calculate sum of 1 to N number using loop.
2. To calculate sum of 1 to N number using equation. 3. To calculate sum of 1 to N numbers using recursion.

CODE:

```
#include <stdio.h>

int count_loop=0; int  count_rec=0;
int count_eq=0;

void loop(int );  int
rec(int ); void
eq(int );


int main()
{    int n;
   printf("enter value of n =");
scanf("%d",&n);



   loop(n);     eq(n);
   int recursion=rec(n);

   printf("sum of rec=%d\n",recursion);
   printf("rec count=%d",count_rec);

   return 0;
}

void loop(int n){    int
```

```
sum_loop=0;    for(int i=0;i<=n;i++){
sum_loop=sum_loop+i;
count_loop++;
   }
   printf("LOOP_____\n");    printf("sum
of loop=%d\n",sum_loop);    printf("loop
count=%d\n",count_loop);

}

void eq(int n){    int sum_eq=0;    count_eq;
sum_eq=(n*(n+1))/2;    count_eq++;
printf("\nEQUATION_____\n");
printf("sum of eq=%d\n",sum_eq);    printf("eq
count=%d\n",count_eq);
printf("\nRECUSRION_____\n");

}

int rec(int n){
if (n <=
1){
count_rec++;       return  n;
          }        else
{
count_rec++;       return
n + rec(n - 1);

   }
}
```

OUTPUT:

```
enter value of n =500
LOOP_________________
sum of loop=125250
loop count=501

EQUATION_____________________
sum of eq=125250
eq count=1

RECUSRION____________________
sum of rec=125250
rec count=500%
```

Graph :

values	loop count	equation cou	recusrion count
500	501	1	500
1000	1001	1	1000
1500	1501	1	1500
2000	2001	1	2000
2500	2500	1	2500