```c
//Program -1
#include<stdio.h>
int main()
{
    int i,j,n,s,c,count=0;
    printf("enter n value: ");
    count++;
    scanf("%d",&n);
    for(i=0;i<n;i++){
        count++;
        for(s=0;s<n-i-1;s++){
            count++;
            printf("  ");
            count++;
        }count++;

        for(j=0;j<i+1;j++){
            count++;
            if(j==0){
            c=1;
            count++;
            }

            else{
            c=c*(i-j+1)/j;
            count++;
            printf("%d   ",c);
            count++;
            }
        }count++;
        printf("\n");
        count++;
    }count++;
    printf("count: %d",count);
}
```

```
PS C:\c_prg> cd daa_prg
PS C:\c_prg\daa_prg> cd day_2
PS C:\c_prg\daa_prg\day_2> gcc pscl_tri_1.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
enter n value: 5

      1
    2   1
  3   3   1
4   6   4   1
count: 82
PS C:\c_prg\daa_prg\day_2>
```

```c
//Program -2
#include<stdio.h>
int bs(int arr[],int si,int key){
    int ll=0,ul=si-1,mid,pos=-1;
    int count=0;

    while (ll<=ul){
        count++;
        mid=(ll+ul)/2;
        count++;
        if(arr[mid]==key){
            count++;
            pos=mid;
            count++;
            count++;
            break;
        }
        else if(arr[mid]>key){
          count++;
          ul=mid-1;
          count++;
        }

        else if(arr[mid]<key){
            count++;
            ll=mid+1;
            count++;
        }

    }count++;
    printf("count: %d\n",count);
    return pos;
}

void main(){
    int key,size;
    printf("Enter the no. of elements wnat to enter: ");
    scanf("%d",&size);

    int arr[size];

    printf("Enter the elements: \n");
    for(int i=0;i<size;i++)
     scanf("%d",&arr[i]);

    printf("Enter the element to be found: ");
    scanf("%d",&key);
```

```
    int res=bs(arr,size,key);

    if(res>0)
      printf("%d found in position %d",key,res);
    else if(res<0)
      printf("Element not found...");
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc bs_2.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter the no. of elements wnat to enter: 5
Enter the elements:
4
9
13
17
22
Enter the element to be found: 9
count: 14
9 found in position 1
PS C:\c_prg\daa_prg\day_2>
```

```
//Program -3
#include<stdio.h>

int amg(int num){
    int rem,sum=0,count=0,n=num;
    while(num>0){
        count++;
        rem=num%10;
        count++;
        sum+=rem*rem*rem;
        count++;
        num/=10;
        count++;
    }count++;

    if(n==sum){
        count++;
        printf("Amstrong number...!");
    }
    else{
        count++;
        printf("Not amstrong...!");
    }
    printf("count: %d",count);
    return 0;
```

```
}

void main(){
    int val;
    printf("value: ");
    scanf("%d",&val);
    amg(val);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc amst_3.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
value: 153
Amstrong number...!count: 14
PS C:\c_prg\daa_prg\day_2> ./a.exe
value: 123
Not amstrong...!count: 14
PS C:\c_prg\daa_prg\day_2>
```

```
//Program -4
#include<stdio.h>
int main()
{
    int a[2][2], b[2][2], c[2][2], i, j;
    int m1, m2, m3, m4 , m5, m6, m7;
    int count=0;
    count++;
    printf("Enter the 4 elements of first matrix: ");
      for(i = 0;i < 2; i++)
      {
        count++;
        for(j = 0;j < 2; j++){
               count++;
               scanf("%d", &a[i][j]);
          }count++;
      }count++;

    printf("Enter the 4 elements of second matrix: ");
      for(i = 0; i < 2; i++){
          count++;
          for(j = 0;j < 2; j++){
               count++;
               scanf("%d", &b[i][j]);
          }
       }
       count++;

      printf("\nThe first matrix is\n");
```

```
for(i = 0; i < 2; i++){
        count++;
        printf("\n");
        for(j = 0; j < 2; j++){
             count++;
             printf("%d\t", a[i][j]);
      }count++;
    }count++;

  printf("\nThe second matrix is\n");
    for(i = 0;i < 2; i++){
        count++;
        printf("\n");
        for(j = 0;j < 2; j++){
         count++;
         printf("%d\t", b[i][j]);
     }count++;
}count++;
m1= (a[0][0] + a[1][1]) * (b[0][0] + b[1][1]);
count++;
m2= (a[1][0] + a[1][1]) * b[0][0];
count++;
m3= a[0][0] * (b[0][1] - b[1][1]);
count++;
m4= a[1][1] * (b[1][0] - b[0][0]);
count++;
m5= (a[0][0] + a[0][1]) * b[1][1];
count++;
m6= (a[1][0] - a[0][0]) * (b[0][0]+b[0][1]);
count++;
m7= (a[0][1] - a[1][1]) * (b[1][0]+b[1][1]);
count++;

c[0][0] = m1 + m4- m5 + m7;
count++;
c[0][1] = m3 + m5;
count++;
c[1][0] = m2 + m4;
count++;
c[1][1] = m1 - m2 + m3 + m6;
count++;

     printf("\nAfter multiplication using Strassen's algorithm \n");
     for(i = 0; i < 2 ; i++){
        count++;
        printf("\n");
    for(j = 0;j < 2; j++){
             count++;
```

```
                printf("%d\t", c[i][j]);
            }count++;
    }count++;

    printf("count: %d",count);
      return 0;
}
```

```
The first matrix is

2       2
2       2
The second matrix is

2       2
2       2
After multiplication using Strassen's algorithm

8       8
8       8       count: 55
PS C:\c_prg\daa_prg\day_2>
```

```
//program -5
#include <stdio.h>
int main()
{
    int n1, n2, i, gcd;
    int count=0;

    printf("Enter two integers: ");
    scanf("%d %d", &n1, &n2);

    for(i=1; i <= n1 && i <= n2; ++i)
    {
        count++;
        if(n1%i==0 && n2%i==0)
        count++;
            gcd = i;
    }

    printf("G.C.D of %d and %d is %d", n1, n2, gcd);
    count++;
    printf(" %d /n",count);

    return 0;
```

```
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc gcd_5.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter two integers: 15
30
G.C.D of 15 and 30 is 15 20 /n
PS C:\c_prg\daa_prg\day_2>
```

```c
//Program -6
#include <stdio.h>

int binomialCoeff(int n, int k)
{
    int C[n+1][k+1];
    int i, j;

    for (i = 0; i <= n; i++)
    {
        for (j = 0; j <= k && j <= i; j++)
        {
            if (j == 0 || j == i)
                C[i][j] = 1;
            else
                C[i][j] = C[i-1][j-1] + C[i-1][j];
        }
    }

    return C[n][k];
}

int main()
{
    int n = 8, k =5;
    printf("Value of C(%d, %d) is %d", n, k, binomialCoeff(n, k));
    return 0;
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc bico_6.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Value of C(8, 5) is 56
PS C:\c_prg\daa_prg\day_2>
```

```c
//Program -7
#include<stdio.h>

void main(){
    int ele,key,flag=0,pos,count=0;
    printf("Enter tot element: ");
    scanf("%d",&ele);

    int arr[ele];
    printf("Enter the elements: ");

    for(int i=0;i<ele;i++){
        count++;
        scanf("%d",&arr[i]);
    }count++;

    printf("Entre the search elements: ");
    scanf("%d",&key);

    for (int i = 0; i < ele; i++)
    {
        count++;
        if(key==arr[i]){
            count++;
            flag=1;
            count++;
            pos=i;
            count++;
            count++;
            break;
        }
        else{
         count++;
         flag=0;
         count++;
        }

    }count++;

    if(flag==1){
        count++;
        printf("Element found @ pos: %d",pos);
    }
    else{
        count++;
        printf("Element not found...!");
    }
```

```
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc lin_7.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter tot element: 5
Enter the elements: 12
5
19
14
26
Entre the search elements: 14
Element found @ pos: 3
PS C:\c_prg\daa_prg\day_2>
```

```c
//Program -8
#include<stdio.h>
int grtst(int arr[],int si){
    int max=0,count=0,cmp=0;
    for (int  i = 0; i < si; i++){
        count++;
        cmp++;
        if(max<arr[i]){
            count++;
           max=arr[i];
           count++;
        }
    }count++;

    printf("greatest element in array: %d\n",max);
    printf("count: %d\n",count);
    printf("comparision: %d\n",cmp);
    return 0;
}

void main(){
    int size;
    printf("Enter tot element: ");
    scanf("%d",&size);

    int arr[size];

    printf("Enter the elements: ");
    for (int i = 0; i < size; i++)
        scanf("%d",&arr[i]);
```

```
    grtst(arr,size);

}
```

```
PS C:\c_prg\daa_prg\day_2> gcc grts_8.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter tot element: 5
Enter the elements: 26
7
3
14
18
greatest element in array: 26
count: 8
comparision: 5
PS C:\c_prg\daa_prg\day_2>
```

```
#include<stdio.h>

int facto(int val){
    int count=0,fact=1;
    if(val>0){
        count++;
        count++;
        fact*=facto(val-1)*val;
    }
    else{
     count++;
     printf("count: %d\n",count);
     return fact;
    }

}

void main(){
    int num;
    printf("Enter the value: ");
    scanf("%d",&num);
    int res=facto(num);
    printf("factorial: %d",res);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc fact_9.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter the value: 5
count: 1
factorial: 120
PS C:\c_prg\daa_prg\day_2>
```

```c
#include<stdio.h>

int fab(int n){
    int n1=0,n2=1,n3,c=0,sum=0,ini=0;
    int count=0;
    printf("%d %d ",n1,n2);
    while(c<n){
        count++;
        n3=n1+n2;
        count++;
        printf("%d ",n3);
        if(ini%2==0){
            count++;
            sum+=n3;
            count++;
            c++;
            count++;
        }
        ini++;
        count++;
        n1=n2;
        count++;
        n2=n3;
        count++;
    }count++;
    printf("\nsum: %d\n",sum);
    printf("count: %d",count);
    return 0;
}

void main(){
int n;
printf("Enter the n value: ");
scanf("%d",&n);

fab(n);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc fab_10.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter the n value: 4
0 1 1 2 3 5 8 13 21
sum: 33
count: 48
PS C:\c_prg\daa_prg\day_2>
```

```c
#include<stdio.h>

void main(){
    float N;
    int sum=0,c=0,count=0,val=4;
    printf("Enter the n value: ");
    scanf("%f",&N);

    if(N>=1){
     count++;
    int n=(int) N;
     count++;
    while(c<n){
        count++;
     for(int i=1;i<val;i++){
        count++;
        if(val%i==0){
         count++;
         sum+=i;
         count++;
        }
     }count++;
     if(sum==val){
         count++;
         printf("%d ",sum);
         c++;
         count++;
     }

     sum=0;
     count++;
     val++;
     count++;
     }count++;
```

```
    }
    else{
        count++;
        printf("Invalid input...!");
    }
    printf("\ncount: %d",count);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc prfnum_11.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter the n value: 3
6 28 496
count: 130070
PS C:\c_prg\daa_prg\day_2>
```

```
#include<stdio.h>

void main(){
    char val[25];
    int c=0;

    printf("enter the value: ");
    scanf("%s",&val);

    int count=0;

    while (val[count]!='\0'){
        c++;
        count++;
        c++;
    }c++;

    int new_count=0;

     for(int i=0,j=count-1;i<count,j>=0;i++,j--){
        c++;
        if(val[i]==val[j]){
            c++;
            new_count++;
        }
     }c++;


    if(new_count==count){
```

```
        printf("palindrome...");
        c++;
    }

    else{
        printf("not palindrome...");
        c++;
    }

     printf("\ncount: %d",c);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc pland_12.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
enter the value: madam
palindrome...
count: 23
PS C:\c_prg\daa_prg\day_2> ./a.exe
enter the value: act
not palindrome...
count: 13
PS C:\c_prg\daa_prg\day_2>
```

```
#include<stdio.h>

int sel_sort(int arr[],int si){
    int count=0;
    for (int i = 0; i < si; i++)
    {
        count++;
        for (int j = i+1; j < si; j++)
        {
            count++;
            if(arr[j]<arr[i]){
                count++;
                int temp=arr[j];
                count++;
                arr[j]=arr[i];
                count++;
                arr[i]=temp;
                count++;
            }
        }count++;
    }count++;

    printf("Sorted array: ");
    for (int i = 0; i < si; i++)
```

```
    {
        count++;
        printf("%d ",arr[i]);
    }
    printf("count: %d",count);
    return 0;
}

void main(){
    int size;
    printf("Enter tot element: ");
    scanf("%d",&size);

    int arr[size];

    printf("Enter the elements: ");
    for(int i=0;i<size;i++)
     scanf("%d",&arr[i]);

     sel_sort(arr,size);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc selsor_13.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter tot element: 5
Enter the elements: 19
7
11
13
17
Sorted array: 7 11 13 17 19 count: 42
PS C:\c_prg\daa_prg\day_2>
```

```
#include <stdio.h>

void printSubsets(int set[], int size)
{ int count=0;
  count++;
    for (int i = 0; i < (1<<size); i++)
    {
        count++;
        printf("{ ");
        for (int j = 0; j < size; j++)
        {
            count++;
            if (i & (1 << j)){
```

```
                count++;
                printf("%d ", set[j]);
            }

        }count++;
        printf("},");
    }count++;
    printf("\ntime complexity: %d",count);

}

int main()
{
    int set[] = {1, 2, 3};
    int size = sizeof(set)/sizeof(set[0]);
    printSubsets(set, size);
    return 0;
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc subset_15.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
{ },{ 1 },{ 2 },{ 1 2 },{ 3 },{ 1 3 },{ 2 3 },{ 1 2 3 },
time complexity: 54
PS C:\c_prg\daa_prg\day_2>
```

```
#include<stdio.h>

void substr(char str[],char sub[],int strs,int subs){
    int pos=0,flag=0;
    if(strs<subs){
        printf("String not found..!");
    }

    if(subs<strs){
        for (int i = 0; i < strs; i++)
        {

            if(str[i]==sub[0]){
                pos=i;
                break;
            }

        }
```

```
        for (int i = pos,j=0; i < (pos+(strs-subs)); i++,j++)
        {
            if(str[i]!=sub[j]){
                flag=1;
                break;
            }
        }

        if(flag==0){
            printf("sub string found...!");
        }

        else{
            printf("sub string not found...!");
        }

    }

}

void main(){
    int strs=0,subs=0;
    char str[50],sub[50];
    printf("Enter the string: ");
    scanf("%s",&str);

    printf("Enter the sub_string: ");
    scanf("%s",&sub);

    while(str[strs]!='\0')
     strs++;

    while(sub[subs]!='\0')
     subs++;

    substr(str,sub,strs,subs);

}
```

```
PS C:\c_prg\daa_prg\day_2> gcc substr_16.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter the string: alpha
Enter the sub_string: pha
sub string found...!
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter the string: abababab
Enter the sub_string: bcbc
sub string not found...!
PS C:\c_prg\daa_prg\day_2>
```

```c
#include <stdio.h>

void countingSort(int array[], int size) {
    int c=0;
    int max = array[0];
    for (int i = 1; i < size; i++) {
        c++;
        if (array[i] > max){
            c++;
            max = array[i];
        }
    }c++;

    int count[max + 1];
    for (int i = 0; i <= max; i++){
        c++;
        count[i] = 0;
    }c++;

    for (int i = 0; i < size; i++){
        c++;
        count[array[i]]++;
    }c++;

    int j = 0;
    for (int i = 0; i <= max; i++) {
        c++;
        while (count[i] > 0) {
            c++;
            array[j++] = i;
            c++;
            count[i]--;
            c++;
        }c++;
    }c++;
```

```
    printf("time complexity: %d\n",c);
}


int main() {
    int array[] = {4, 2, 2, 8, 3, 3, 1};
    int size = sizeof(array) / sizeof(array[0]);
    countingSort(array, size);
    for (int i = 0; i < size; i++)
        printf("%d ", array[i]);
    return 0;
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc srtnoswap_17.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
time complexity: 661 2 2 3 3 4 8
PS C:\c_prg\daa_prg\day_2> gcc srtnoswap_17.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
time complexity: 66
1 2 2 3 3 4 8
PS C:\c_prg\daa_prg\day_2>
```

```
#include<stdio.h>

void main(){
    char val[25];

    printf("enter the value: ");
    scanf("%s",&val);

    int count=0,c=0;

    while (val[count]!='\0'){
        count++;
        c++;
    }c++;


    for(int i=count-1;i>=0;i--){
        c++;
        printf("%c",val[i]);
    }c++;
    printf("\ncount: %d",c);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc revstr_18.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
enter the value: hello
olleh
count: 12
PS C:\c_prg\daa_prg\day_2>
```

```c
#include<stdio.h>

void main(){
    int ele,count=0;

    printf("Enter tot element: ");
    scanf("%d",&ele);

    int arr[ele];
    printf("Enter the elements: ");

    for (int i = 0; i < ele; i++){
        count++;
        scanf("%d",&arr[i]);
    }count++;


    for (int i = 0; i < ele; i++)
    {count++;
        for (int j =i+1; j < ele; j++)
        {count++;
         if (arr[i]>arr[j])
         {
            count++;
            int temp=arr[i];
            count++;
            arr[i]=arr[j];
            count++;
            arr[j]=temp;
            count++;
         }
        }count++;

    }count++;

    printf("sorted array: ");
    for (int i = 0; i < ele; i++)
    {count++;
```

```
        count++;
        printf("%d  ",arr[i]);
    }count++;
    printf("count: %d",count);
}
```

```
PS C:\c_prg\daa_prg\day_2> gcc bubsort_19.c
PS C:\c_prg\daa_prg\day_2> ./a.exe
Enter tot element: 5
Enter the elements: 2
19
26
9
12
sorted array: 2  9  12  19  26  count: 54
PS C:\c_prg\daa_prg\day_2>
```