CSA0672 – DAA – DAY 2

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7. Write a program to generate all the reverse of a prime should be prime

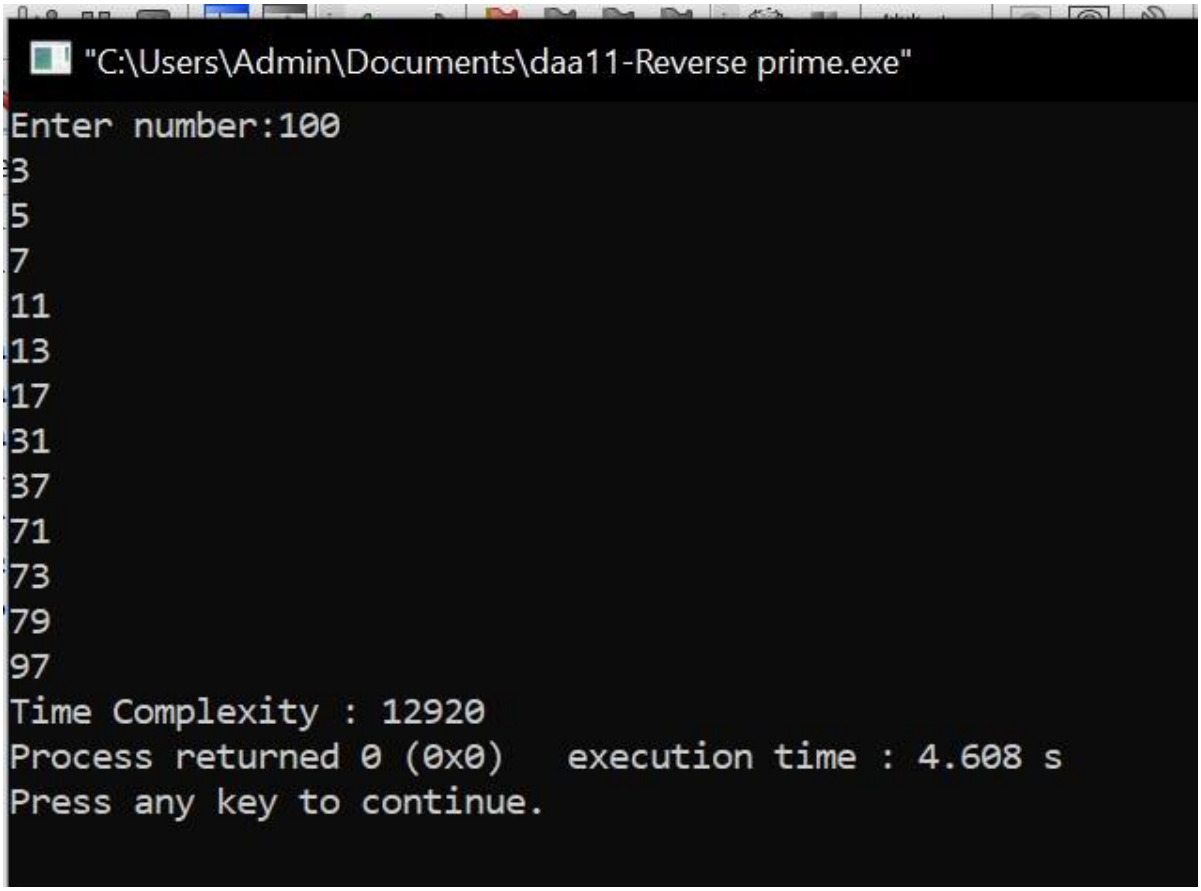
(for example 907 is prime and reverse 709 is also prime)

Generate all the no's upto N and estimate time complexity.

Program:

```
#include<stdio.h>          int
main() {      int c=0;      int
n,n1,f,i,j,k,r,p[100],f1;    int
sum=0,b=0,rev=0;       c++;
c++;   c++;    printf("Enter
number:");
scanf("%d",&n);
for(j=3;j<=n;j++)
  {       c++;
f=0;   c++;
for(i=2;i<j;i++)
     {
c++;          c++;
if(j%i==0)
        {
          f=f+1;   c++;
        }              }
c++;              c++;
if(f==0)              {
n1=j;              c++;
```

```
rev=0;              c++;
while (n1!=0)
        {               c++;
r=n1%10; c++;
rev=(rev*10)+r; c++;
n1=n1/10; c++;
        }           c++;
f1=0;   c++;
for(k=2;k<rev;k++)
        {
c++;                c++;
if(rev%k==0)
            {
f1++;   c++;
            }
        }
        c++;
c++;
if(f1==0)
        {
printf("%d\n",j);
        }
    }   }   c++;   printf("Time
Complexity : %d",c); }
```



8. Compute the program to find the GCD of two numbers. And also find the finf of time Recursion used to estimate time complexity.

Program:

#include<stdio.h> int main() { int c=0; int a,b,af[100],bf[100],cf[100],a1,b1,c1,i,j,g;

printf("Enter 1st number : "); scanf("%d",&a); printf("Enter 2nd number : "); scanf("%d",&b); a1=-1; c++;

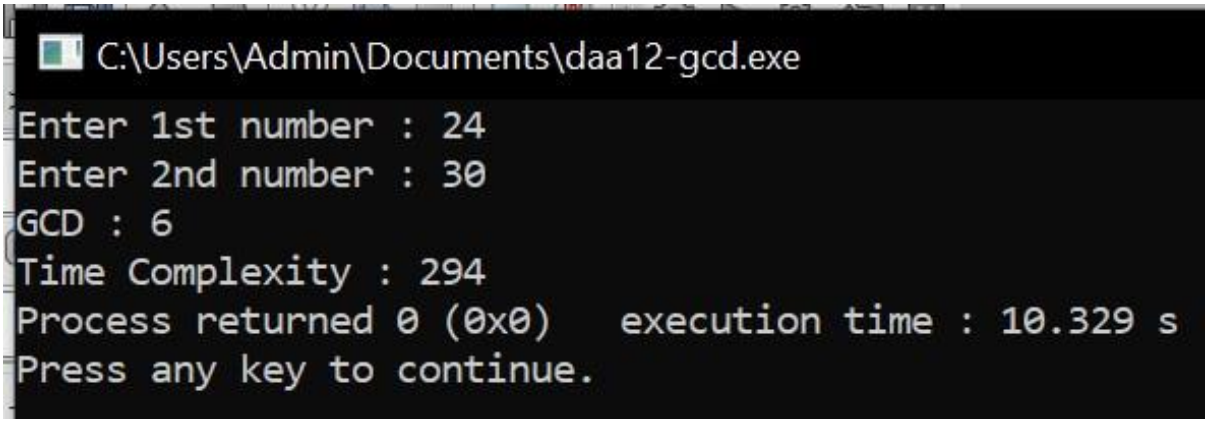
for(i=1;i<=a;i++)

{ c++;

c++;

if(a%i==0)

```
      {             a1=a1+1;
c++;                af[a1]=i;
c++;
      }
   }    c++;    b1=-
1;  c++;
for(i=1;i<=b;i++)
   {
      c++;
c++;
if(b%i==0)
      {
         b1=b1+1;   c++;
bf[b1]=i;   c++;
      }    }    c++;
c1=-1;  c++;
for(i=0;i<a1+1;i++)
   {       c++;
for(j=0;j<b1+1;j++)
      {           c++;
c++;
if(af[i]==bf[j])           {
g=af[i];   c++;
         }       }       c++;    }
c++;    printf("GCD : %d\n",g);
printf("Time Complexity : %d",c); }
```



9. Generate a program for Pascal triangle.

Estimate the time complexity for the row=5

1

1 1

1 2 1

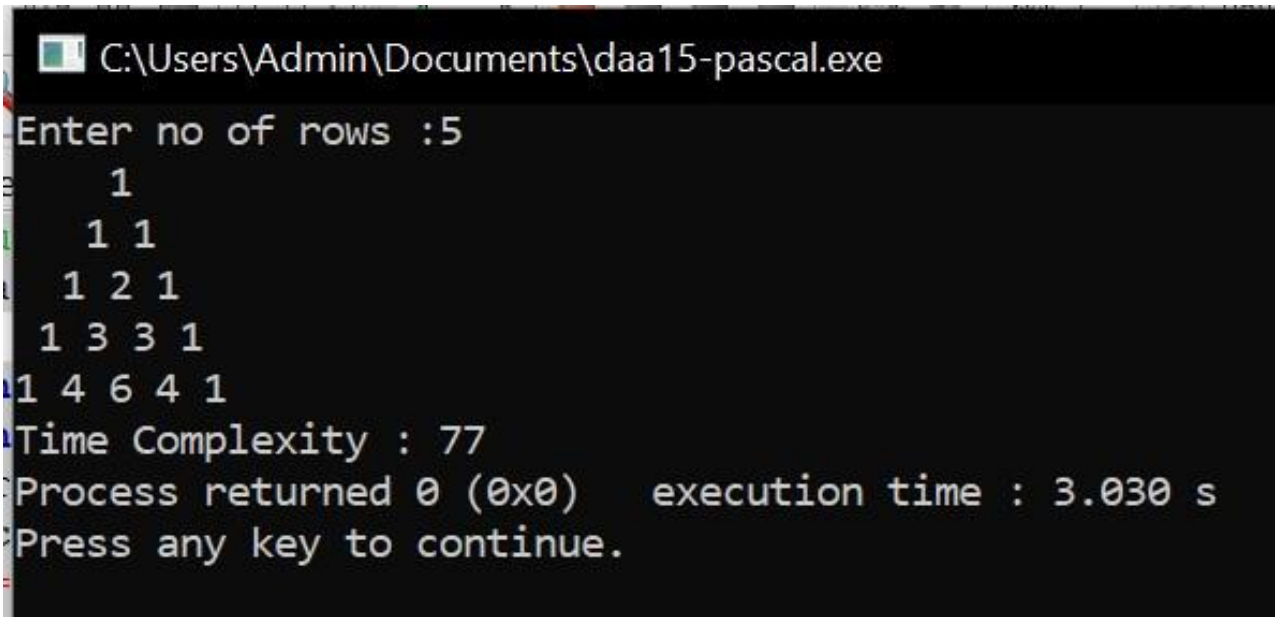
1 3 3 1 1

4 6 4 1

Program:

```
#include<stdio.h> int main() {
int c=0;        int n,i,j,k,s,c1;
printf("Enter no of rows :");
scanf("%d",&n);   k=n;   c++;
for(i=0;i<n;i++)
  {       c++;
k=k-1;  c++;
for(s=0;s<k;s++)
      {
c++;
printf(" ");
      }       c++;
for(j=0;j<=i;j++)
      {
         c++;
c++;
if(j==0)
         {
c1=1;    c++;
         }
else
         {              c1=c1*(i-
j+1)/j;  c++;
```

```
        }
printf("%d ",c1);
      }       c++;
printf("\n");
   }    c++;    printf("Time
Complexity : %d",c); }
```

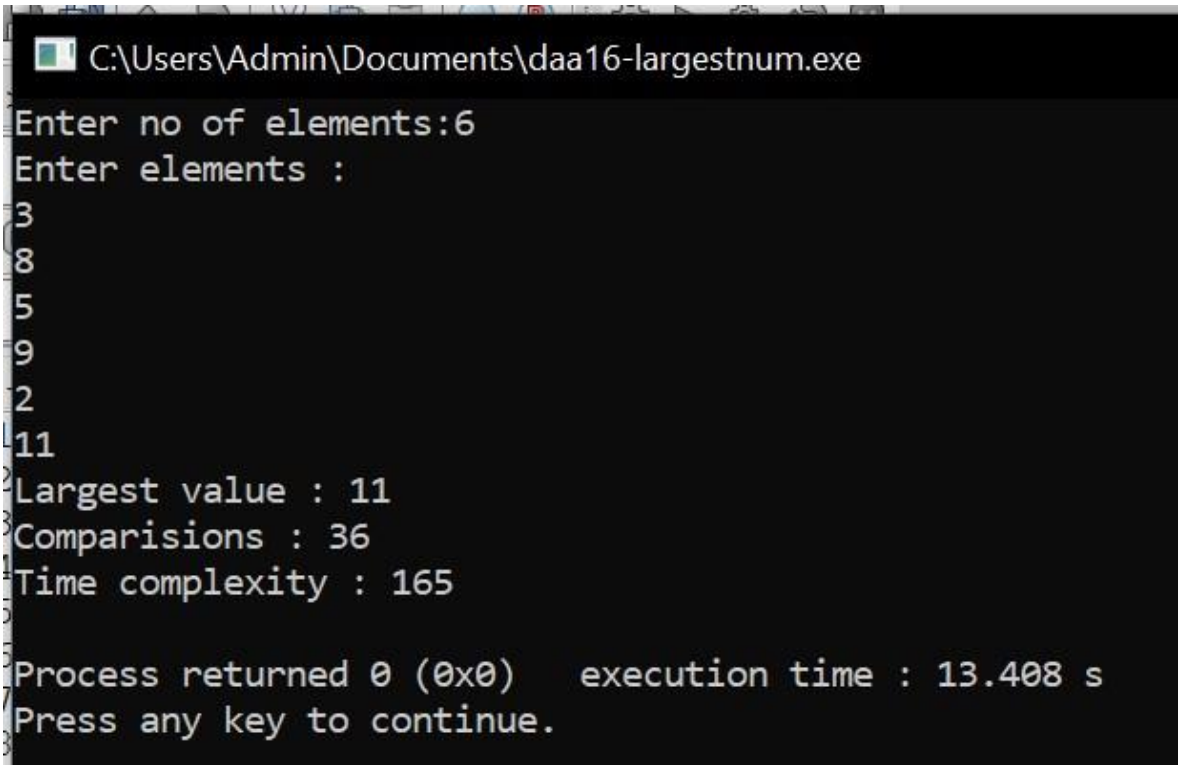


10. Write a program to find the largest element value in an array. Estimate the time complexity and no of comparison for the given set of values.

Program:

```
#include<stdio.h> int main() {
int c=0;    int
com=0,i,j,k,a[100],n;    c++;
printf("Enter no of elements:");
scanf("%d",&n);    printf("Enter
elements :\n");
for(i=0;i<n;i++)
   {       c++;
scanf("%d",&a[i]);
```

```
   }    c++;
for(i=0;i<n;i++)
   {       c++;
for(j=0;j<n;j++)
      {          c++;
com++;  c++;
c++;
if(a[i]>a[j])
         {            k=a[i];
c++;               a[i]=a[j];
c++;                  a[j]=k;
c++;
         }       }       c++;    }    c++;
printf("Largest value : %d\n",a[0]);
printf("Comparisions : %d\n",com);
printf("Time complexity : %d\n",c); }
```



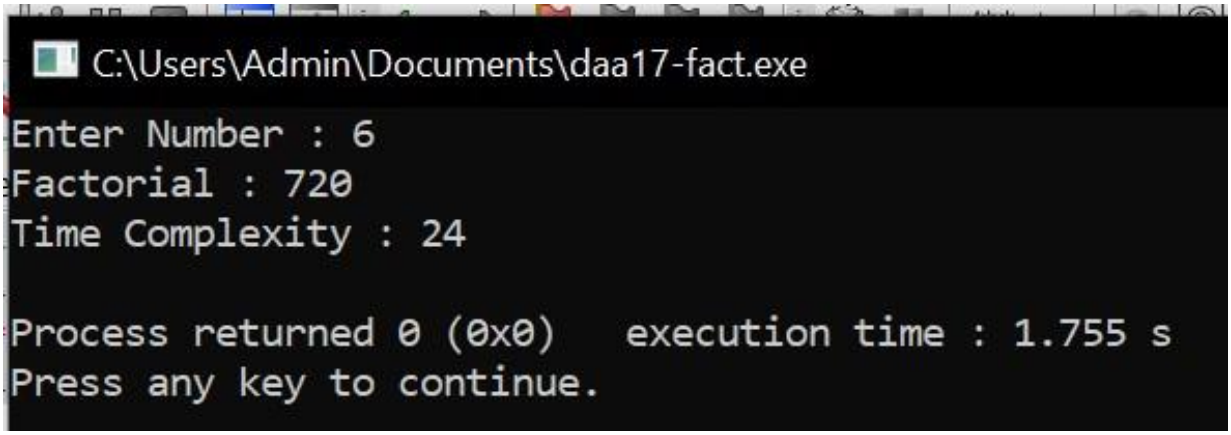
11. Write a program to find the factorial (fact)of a number and to estimate time complexity.

Condition such as i. n=0, return 1 otherwise fact (n-1) * n

Program:

```
#include<stdio.h> int fact(int n); int
c=0; int main() {     int n;
printf("Enter Number : ");
scanf("%d",&n);     fact(n);
printf("Factorial : %d\n",fact(n));
printf("Time Complexity : %d\n",c);
return 0;
} int fact(int
n)
{
   int f;
c++;
if(n<=1)
   {        f= 1;
c++;
   }
else     {
       f= n*fact(n-1); c++;
   }

   return f;
}
```



12. Write a program to print the first n perfect numbers. (Hint Perfect number means a positive integer that is equal to the sum of its proper divisors) Sample Input:

N = 3

Sample Output:

First 3 perfect numbers are: 6 , 28 , 496 Test

Cases:

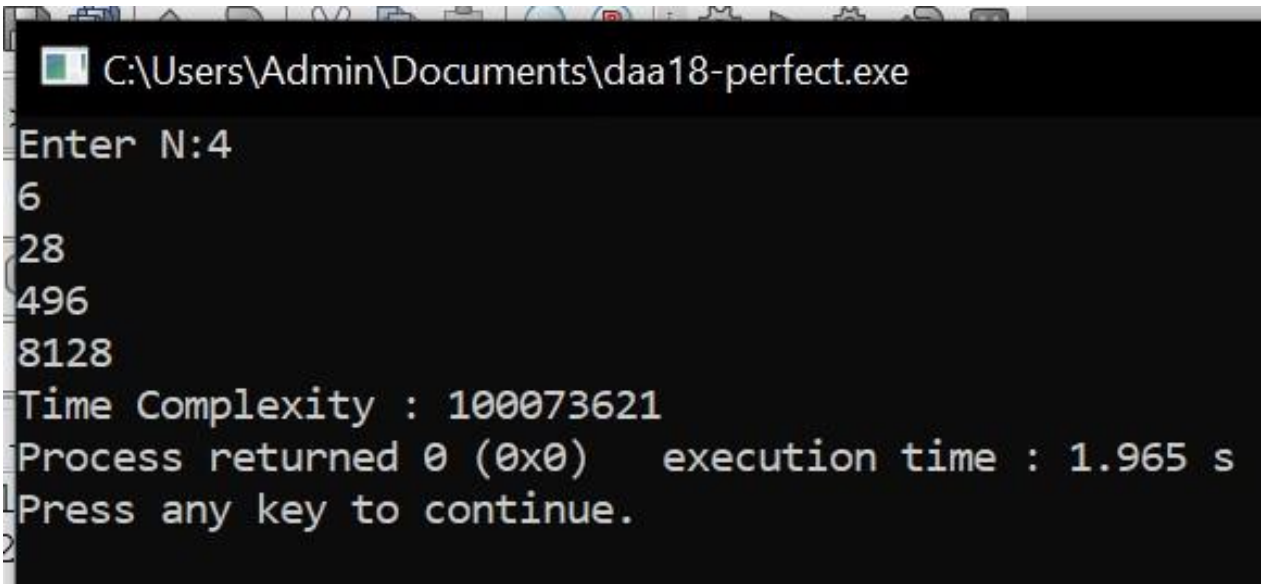
1. **N = 0**
2. **N = 5**
3. **N = -2**
4. **N = -5**

N = 0.2

Program:

```
#include<stdio.h>
int main() {     int
c=0;
   int i,j,sum,n,a[20],k=0;
c++;     printf("Enter N:");
scanf("%d",&n);     c++;
if(n<1)     {
printf("Invalid Input");
   }
   else
   {
      for(i=6;i<10000;i++)
      {           c++;
sum=0;  c++;
for(j=1;j<i-1;j++)
         {
c++;              c++;
if(i%j==0)
            {
               sum=sum+j;  c++;
```

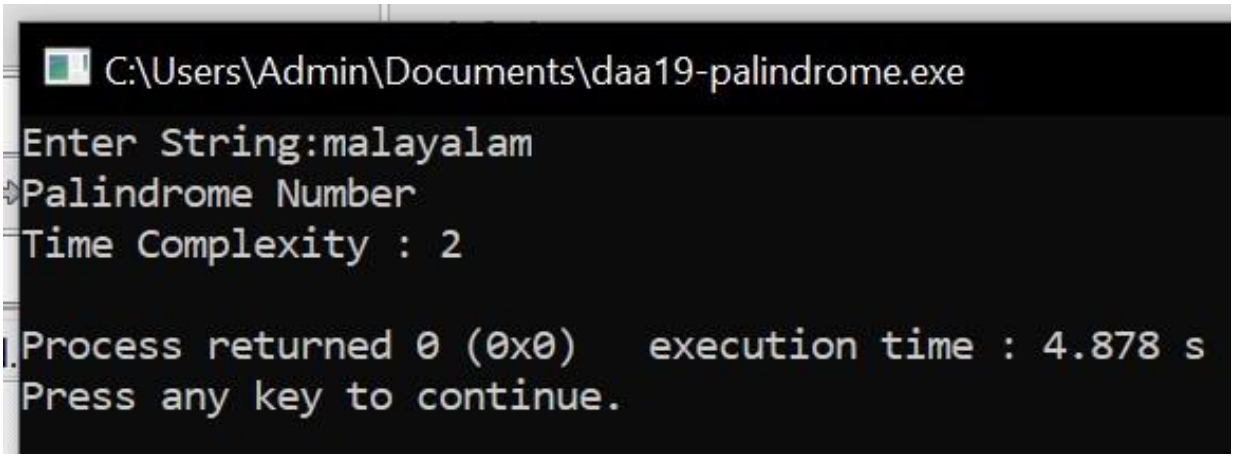
```
            }
}           c++;
c++;
if(i==sum)
        {
a[k++]=i;   c++;
        }       }c++;
for (i=0;i<n;i++)
      {           c++;
printf("%d\n",a[i]);
      }c++;
   }
   printf("Time Complexity : %d",c); }
```



13. Write a C program to check whether is a given input is a palindrome Program:

```
#include<stdio.h>          int
main() {      int c=0;      int
n,r,rev=0,a;                  c++;
printf("Enter     number:");
scanf("%d",&n);         a=n;
c++;     while (n!=0)
   {         c++;
r=n%10; c++;
rev=(rev*10)+r; c++;
n=n/10; c++;
   }     c++;
c++;
if(rev==a)
   {
      printf("Palindrome Number");
   }
else     {
```

```
printf("
Not
Palindr
ome
Number
");
    }
   printf("\nTime Complexity : %d\n",c);
}
```



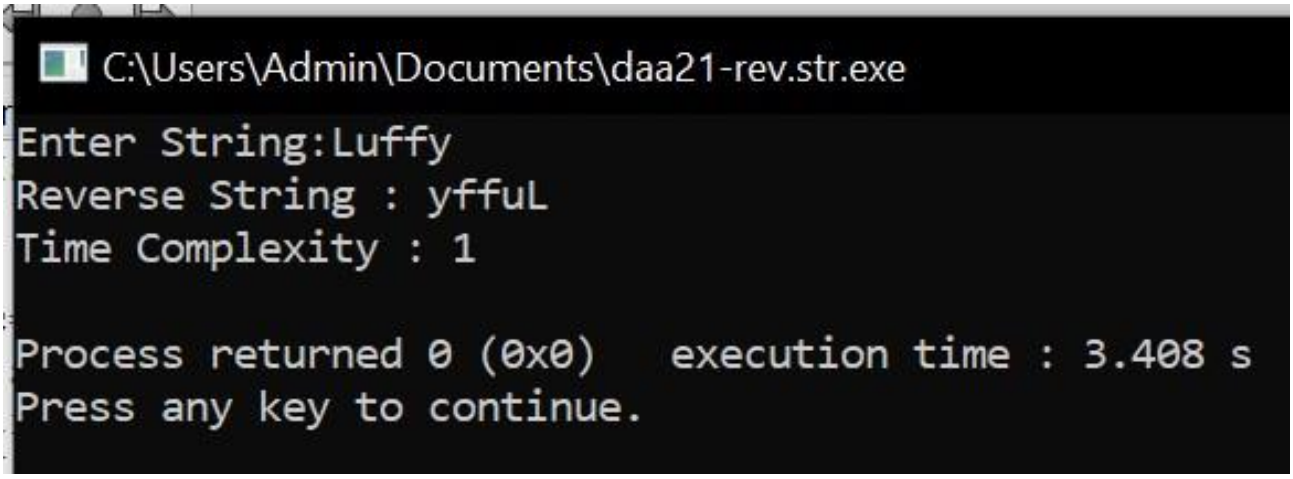
14. Write a program to perform Bubble sort and estimate time Complexity Program:

```
#include<stdio.h> int main() {
int c=0;     int
com=0,i,j,k,a[100],n;     c++;
printf("Enter no of elements:");
scanf("%d",&n);     printf("Enter
elements :\n");
for(i=0;i<n;i++)
   {        c++;
scanf("%d",&a[i]);
   }     c++;
for(i=0;i<n;i++)
   {        c++;
for(j=0;j<n;j++)
      {           c++;
com++;  c++;
c++;
if(a[i]<a[j])
         {              k=a[i];
c++;                a[i]=a[j];
c++;                   a[j]=k;
c++;
         }        }        c++;
}     c++;     printf("Bubble
```

```
Sort :\n");
for(i=0;i<n;i++)
   {       c++;
printf("%d\n",a[i]);
   }     c++;     printf("Time
complexity : %d\n",c);
}
```

15. Write a program to print the reverse of a string. And estimate the time complexity Program:

```
#include<stdio.h> int
main()
{    int c=0,l,i;    char s[20];
printf("Enter String:");
scanf("%s",&s);
l=strlen(s);   c++;
printf("Reverse String : ");
for(i=l-1;i>-1;i--)
   {       c++;
printf("%c",s[i]);
   }
c++;
   printf("\nTime Complexity : %d\n",c);
}
```

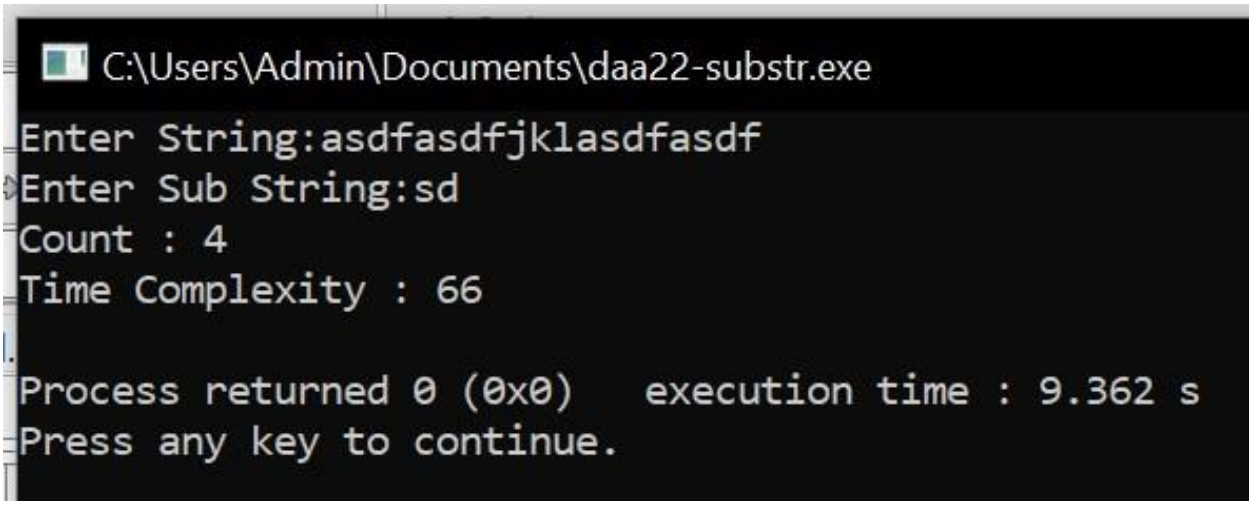


16. Write a program to check sub string is there in a string or not.

Program:

```
#include<stdio.h> int main() { int
c=0,l1,l2,i,cnt=0; char
s[100],sub[20],os[20],at='@',sub1[20]; c++;
printf("Enter String:"); scanf("%s",&s);
printf("Enter Sub String:");
scanf("%s",&sub); l1=strlen(s); c++;
l2=strlen(sub); c++; strncat(sub,&at,1); c++;
for(i=0;i<=l1+1-l2;i++)
  {  c++;
strncpy(os,s+i,l2); c++;
c++;
if(strcmp(sub,os)==0)
    {
cnt++; c++;
    } } c++;
printf("Count : %d",cnt);
printf("\nTime Complexity
: %d\n",c);
```

}



1. Write a C program to merge sort using divide and Conquer

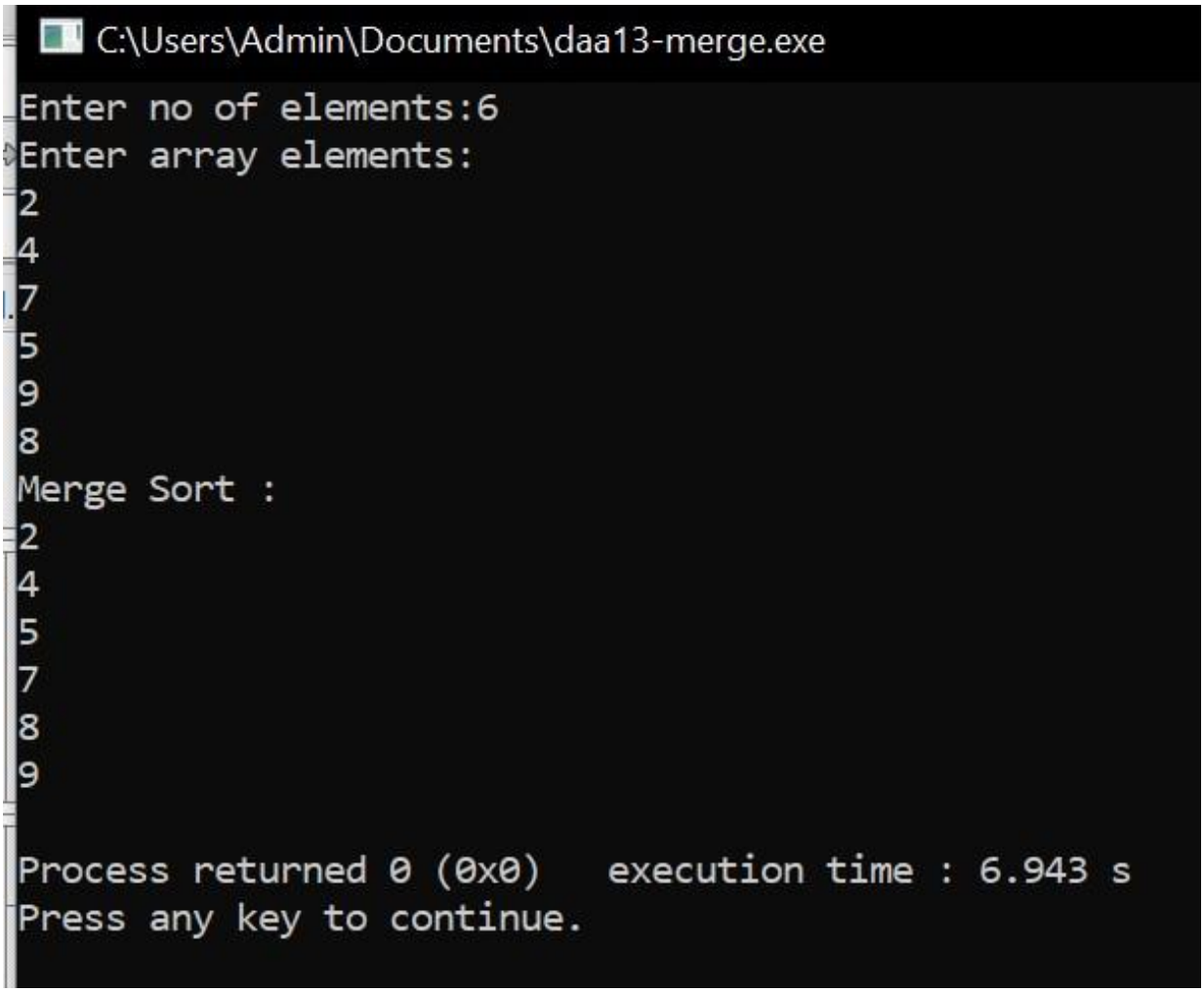
Program:

```
#include<stdio.h> void mergesort(int
a[],int i,int j); void merge(int a[],int i1,int
j1,int i2,int j2); int main() { int a[30],n,i;
printf("Enter no of elements:");
scanf("%d",&n); printf("Enter array
elements:\n"); for(i=0;i<n;i++)
{ scanf("%d",&a[i]);
} mergesort(a,0,n-1);
printf("Merge Sort : \n");
for(i=0;i<n;i++)
{ printf("%d\n",a[i]);
} return
0;
}

void mergesort(int a[],int i,int j)
{ int
mid;
if(i<j)
{
mid=(i
+j)/2;
merges
ort(a,i,
mid);
merges
ort(a,m
id+1,j);
```

```
merge(
a,i,mid,
mid+1,j
);
   }
} void merge(int a[],int i1,int j1,int i2,int
j2)
{    int temp[50];    int
i,j,k;    i=i1;    j=i2;
k=0;    while(i<=j1 &&
j<=j2)
   {
if(a[i]<a[j])
      {
         temp[k++]=a[i++];
      }
else
      {
         temp[k++]=a[j++];
      }
   }
   while(i<=j1)
   {
      temp[k++]=a[i++];
   }
   while(j<=j2)
   {
      temp[k++]=a[j++];
```

```
    }
    for(i=i1,j=0;i<=j2;i++,j++)
    {
a[i]=temp[j];
    }
}
```



2. Write a C program to find max-min using divide and Conquer

Program:

```
#include<stdio.h> void mergesort(int
a[],int i,int j); void merge(int a[],int i1,int
j1,int i2,int j2);
int main()
{
   int a[30],n,i;
```

```
   printf("Enter no of elements:");
scanf("%d",&n);
   printf("Enter array elements:\n");
for(i=0;i<n;i++)
   {
      scanf("%d",&a[i]);
   }
   mergesort(a,0,n-1);
printf("\nMin : %d",a[0]);
printf("\nMax : %d",a[n-1]);
   return 0;
}

void mergesort(int a[],int i,int j)
{    int mid;    if(i<j)    {
mid=(i+j)/2;
mergesort(a,i,mid);
mergesort(a,mid+1,j);
      merge(a,i,mid,mid+1,j);
   }
}
void merge(int a[],int i1,int j1,int i2,int j2)
{    int
temp[50];
int i,j,k;
i=i1;    j=i2;
   k=0;
   while(i<=j1 && j<=j2)
   {
      if(a[i]<a[j])
      {
         temp[k++]=a[i++];
      }
else
      {
         temp[k++]=a[j++];
      }
   }
   while(i<=j1)
   {
```

```
        temp[k++]=a[i++];
    }
    while(j<=j2)
    {
        temp[k++]=a[j++];
    }
    for(i=i1,j=0;i<=j2;i++,j++)
    {
        a[i]=temp[j];
    }
}
```