CSA0672 – DAA – DAY 2

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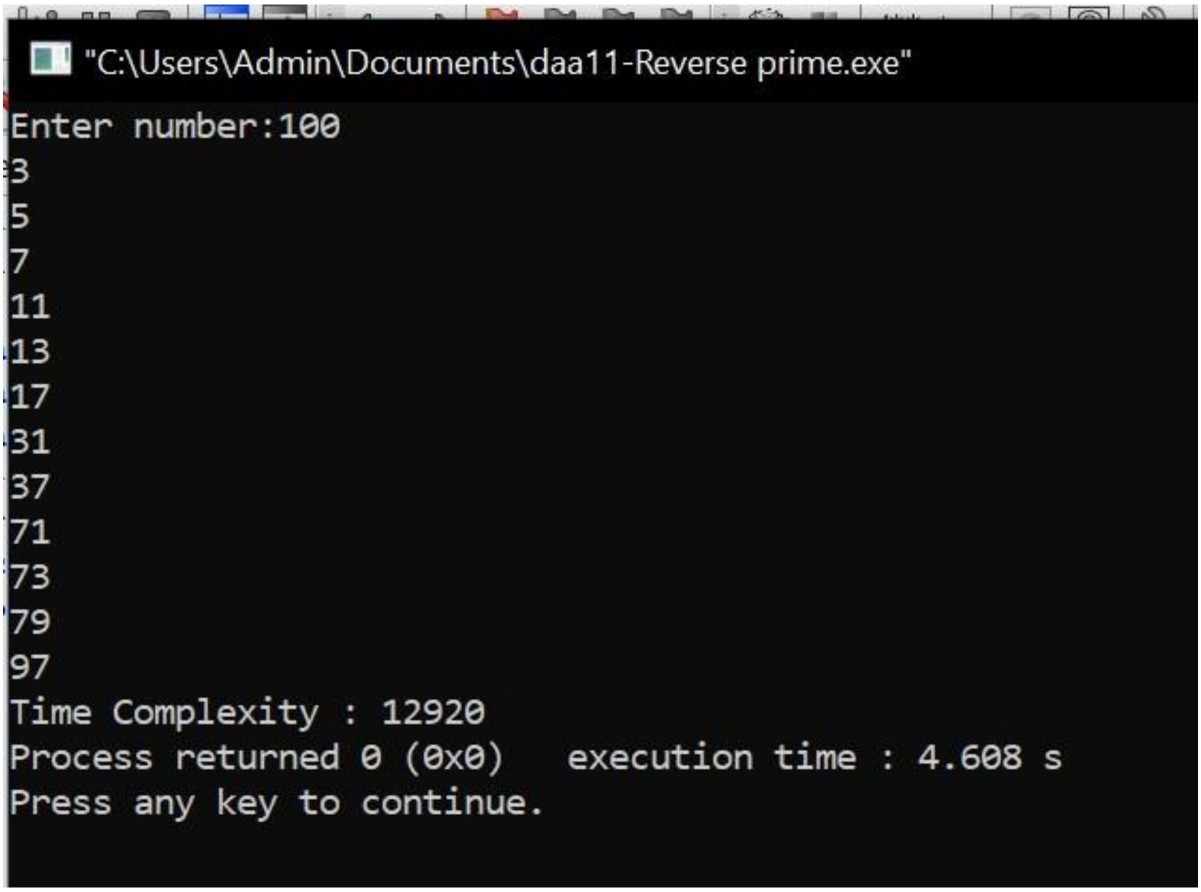
7. Write a program to generate all the reverse of a prime should be prime

(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); }
```



"C:\Users\Admin\Documents\daa11-Reverse prime.exe"

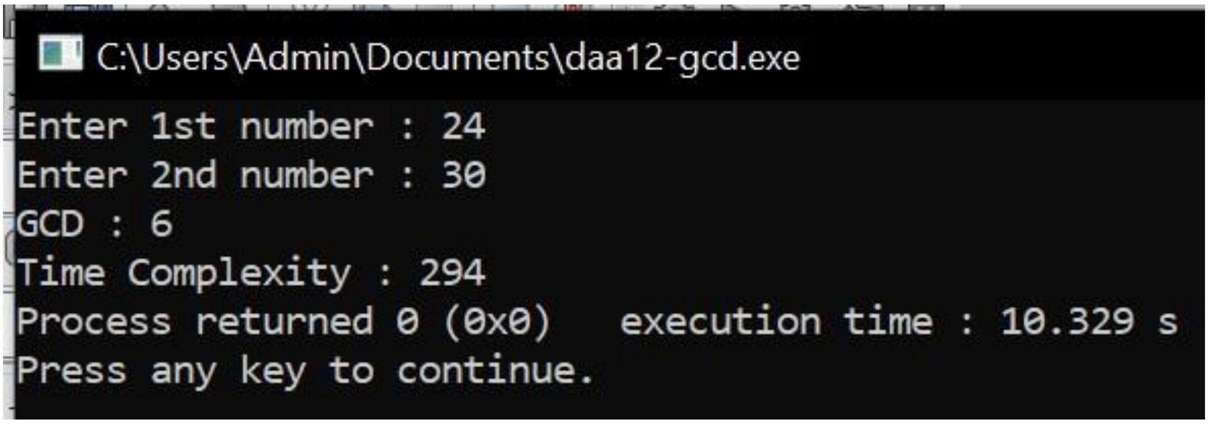
```
Enter number:100
3
5
7
11
13
17
31
37
71
73
79
97
Time Complexity : 12920
Process returned 0 (0x0)   execution time : 4.608 s
Press any key to continue.
```

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); }
```



C:\Users\Admin\Documents\daa12-gcd.exe

```
Enter 1st number : 24
Enter 2nd number : 30
GCD : 6
Time Complexity : 294
Process returned 0 (0x0)   execution time : 10.329 s
Press any key to continue.
```

9. Generate a program for Pascal triangle.

Estimate the time complexity for the row=5

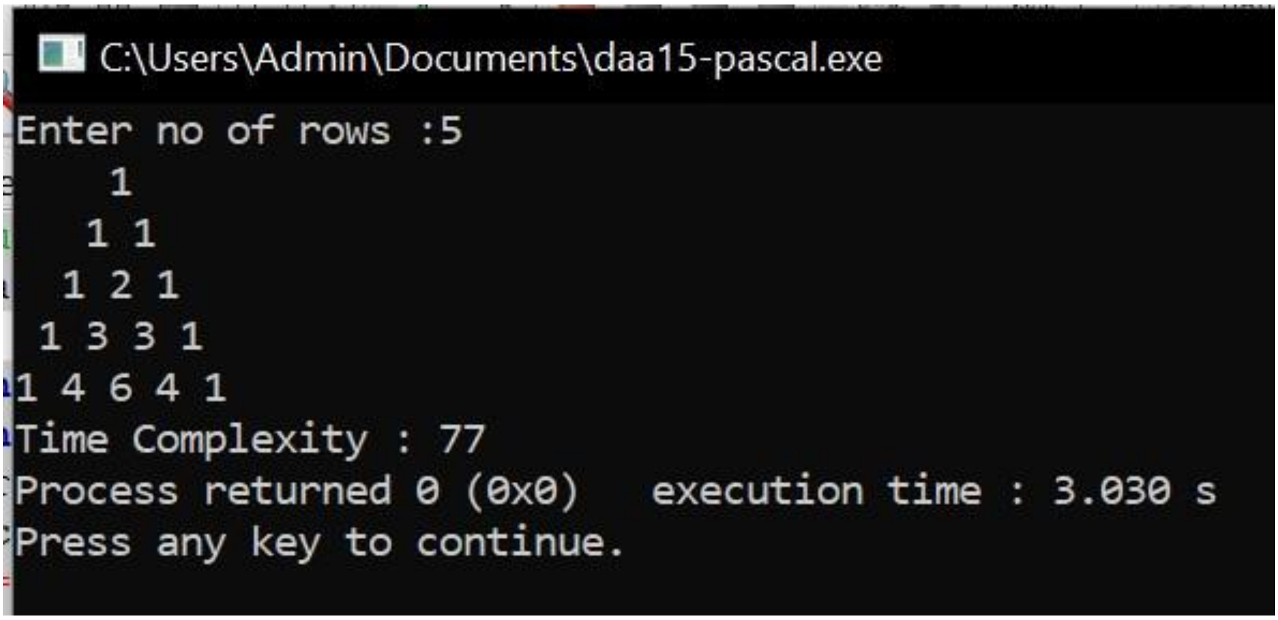
1

```
                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); }
```



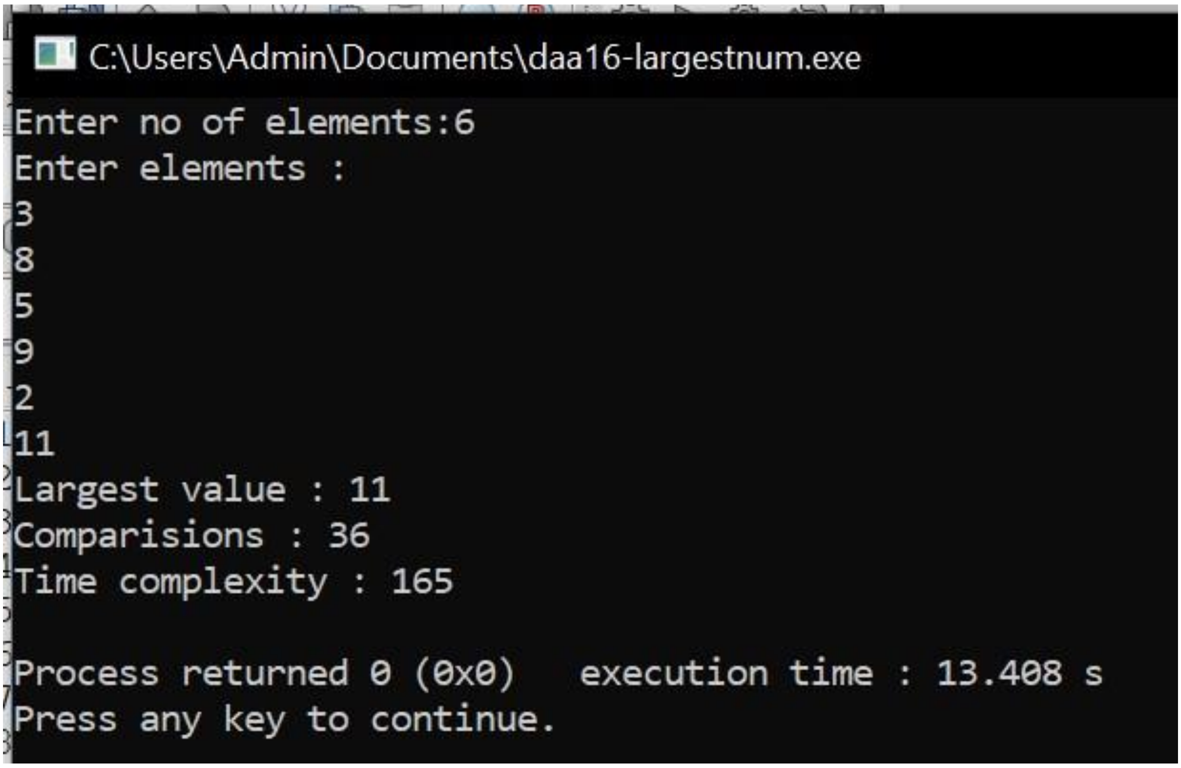
```
C:\Users\Admin\Documents\daa15-pascal.exe
Enter no of rows :5
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
Time Complexity : 77
Process returned 0 (0x0)   execution time : 3.030 s
Press any key to continue.
```

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); }
```



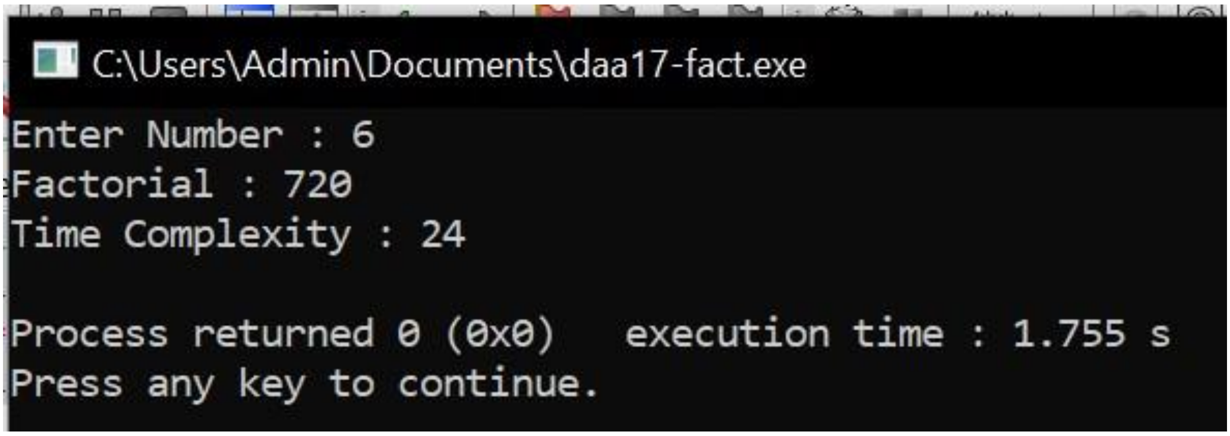
```
Enter no of elements:6
Enter elements :
3
8
5
9
2
11
Largest value : 11
Comparisions : 36
Time complexity : 165

Process returned 0 (0x0)   execution time : 13.408 s
Press any key to continue.
```

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;
}
```



```
C:\Users\Admin\Documents\daa17-fact.exe
Enter Number : 6
Factorial : 720
Time Complexity : 24

Process returned 0 (0x0)   execution time : 1.755 s
Press any key to continue.
```

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:

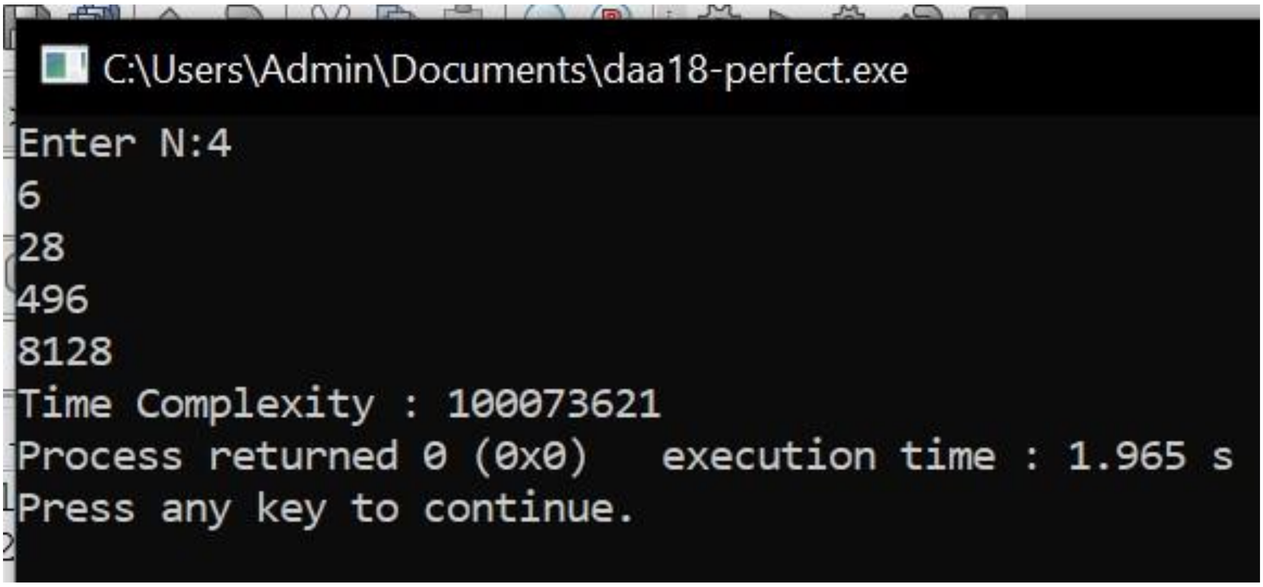
1. **N = 0**
2. **N = 5**
3. **N = -2**
4. **N = -5**

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); }
```



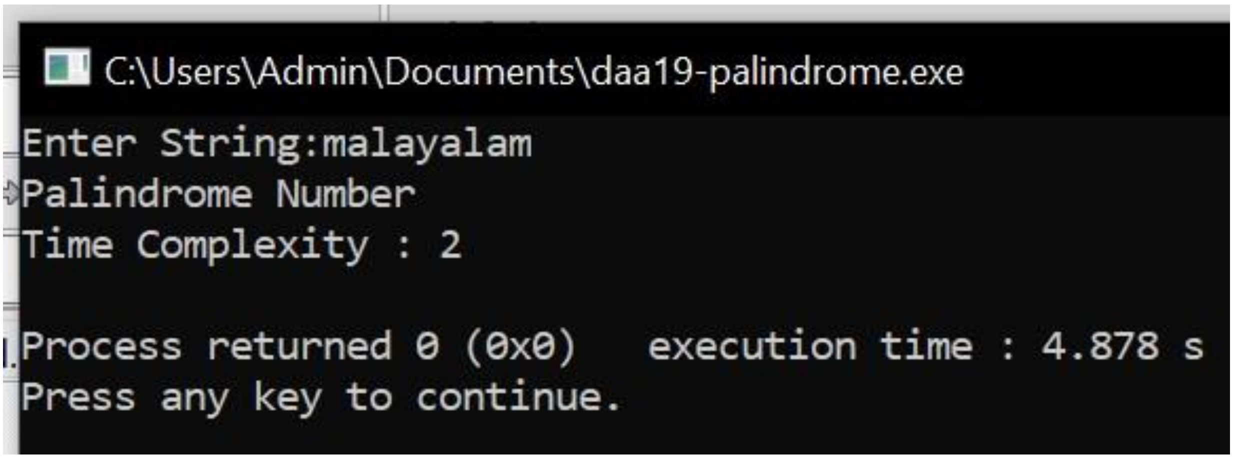
C:\Users\Admin\Documents\daa18-perfect.exe

```
Enter N:4
6
28
496
8128
Time Complexity : 100073621
Process returned 0 (0x0)   execution time : 1.965 s
Press any key to continue.
```

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);
}
```

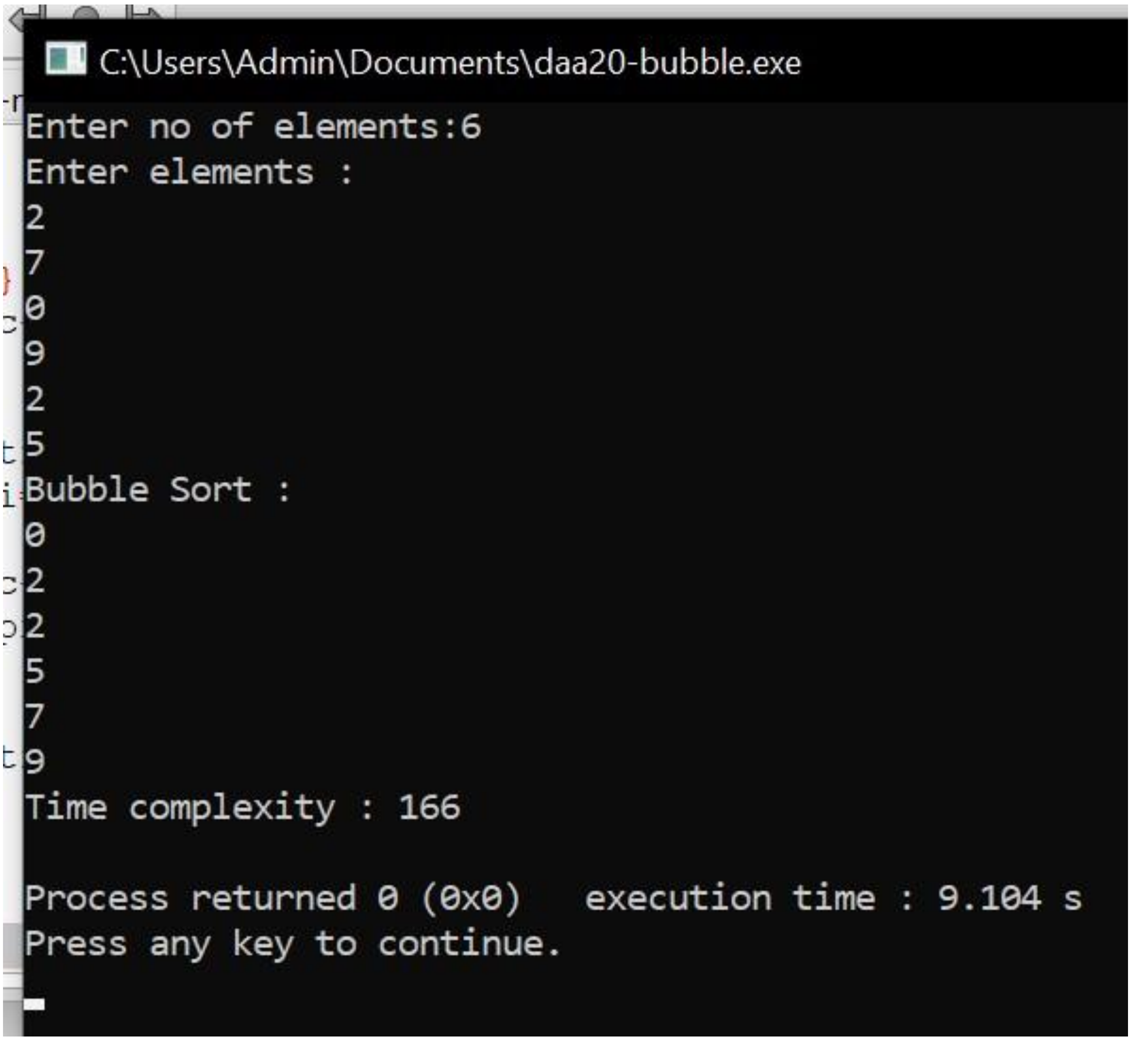


C:\Users\Admin\Documents\daa19-palindrome.exe

```
Enter String:malayalam
Palindrome Number
Time Complexity : 2

Process returned 0 (0x0)   execution time : 4.878 s
Press any key to continue.
```

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

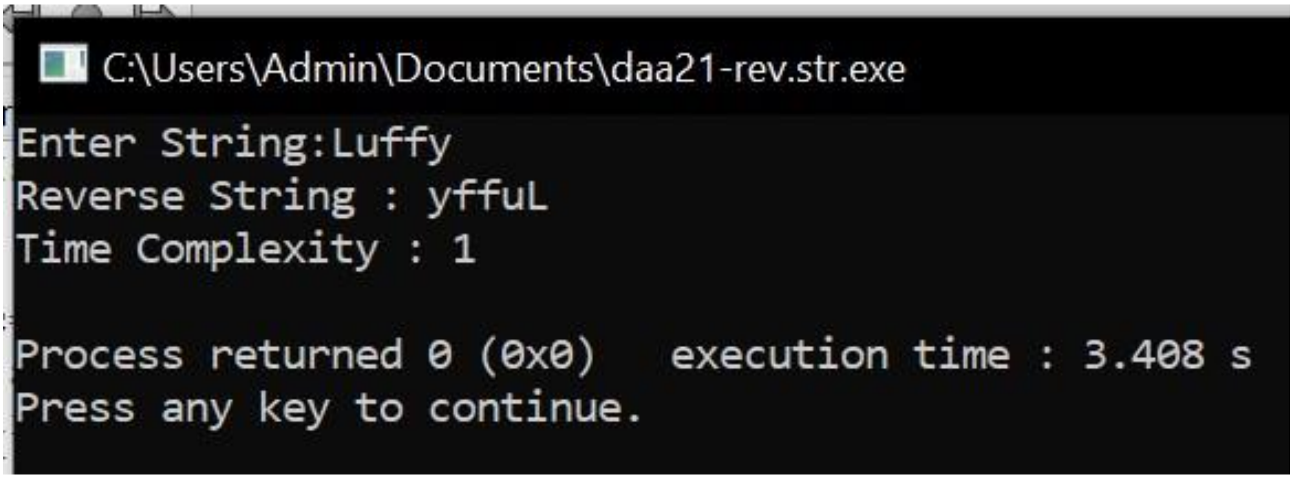
```
#include<stdio.h> int main() {
int c=0;     int
com=0,i,j,k,a[100],n;     c++;
printf("Enter no of elements:");
scanf("%d",&n);     printf("Enter
elements :\n");
for(i=0;i<n;i++)
    {         c++;
scanf("%d",&a[i]);
    }     c++;
for(i=0;i<n;i++)
    {         c++;
for(j=0;j<n;j++)
        {  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



```
Enter no of elements:6
Enter elements :
2
7
0
9
2
5
Bubble Sort :
0
2
2
5
7
9
Time complexity : 166

Process returned 0 (0x0)   execution time : 9.104 s
Press any key to continue.
```

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);
}
```



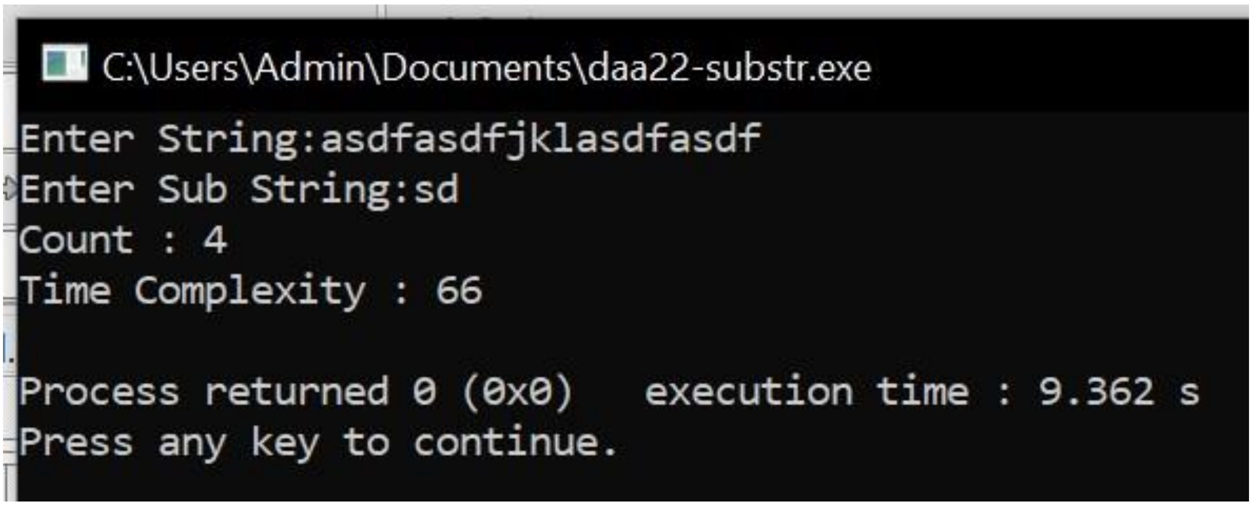
```
Enter String:Luffy
Reverse String : yffuL
Time Complexity : 1

Process returned 0 (0x0)   execution time : 3.408 s
Press any key to continue.
```

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);
```

}



C:\Users\Admin\Documents\daa22-substr.exe

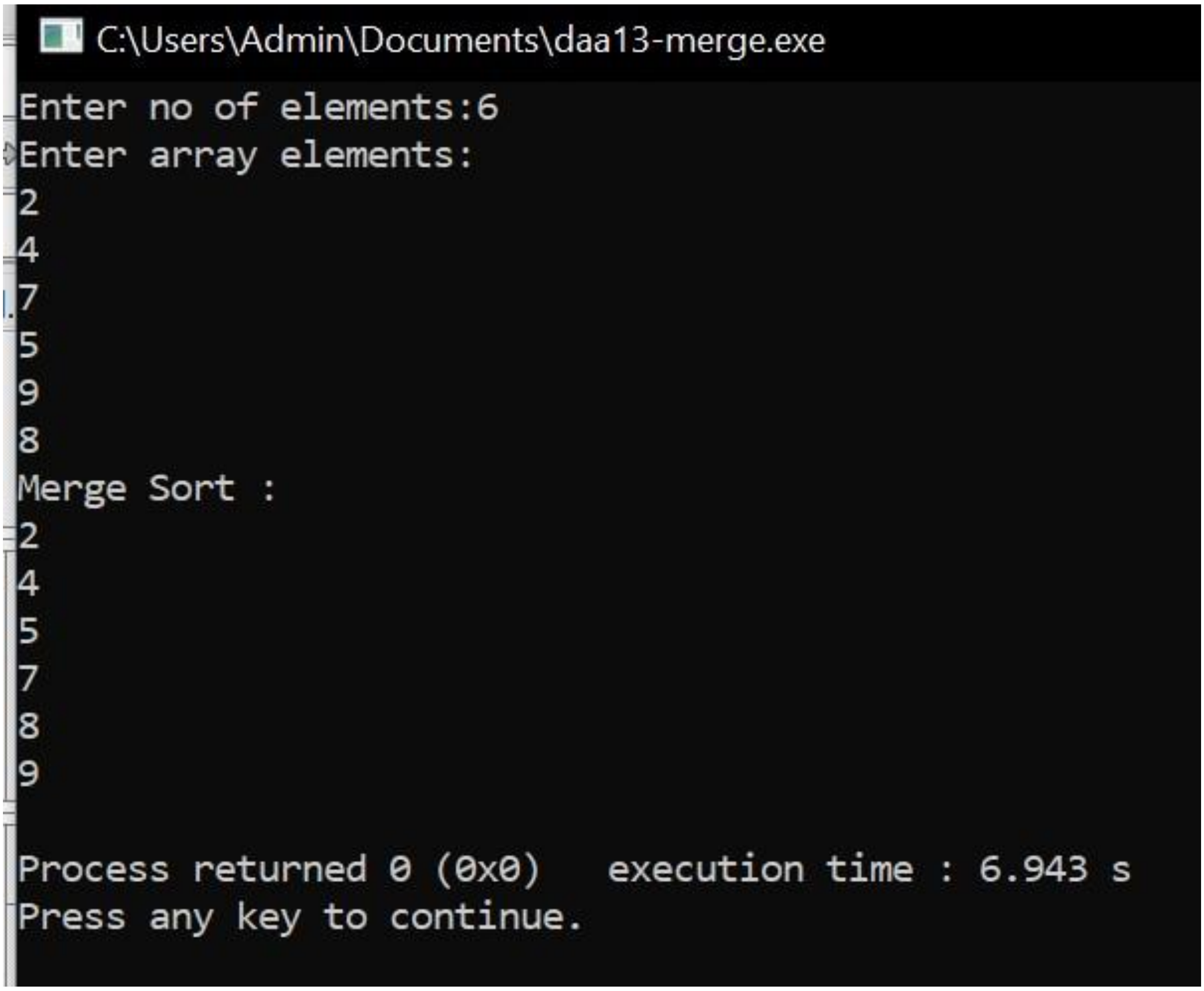
```
Enter String:asdfasdfjklasdfasdf
Enter Sub String:sd
Count : 4
Time Complexity : 66

Process returned 0 (0x0)   execution time : 9.362 s
Press any key to continue.
```

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];
    }
}
```



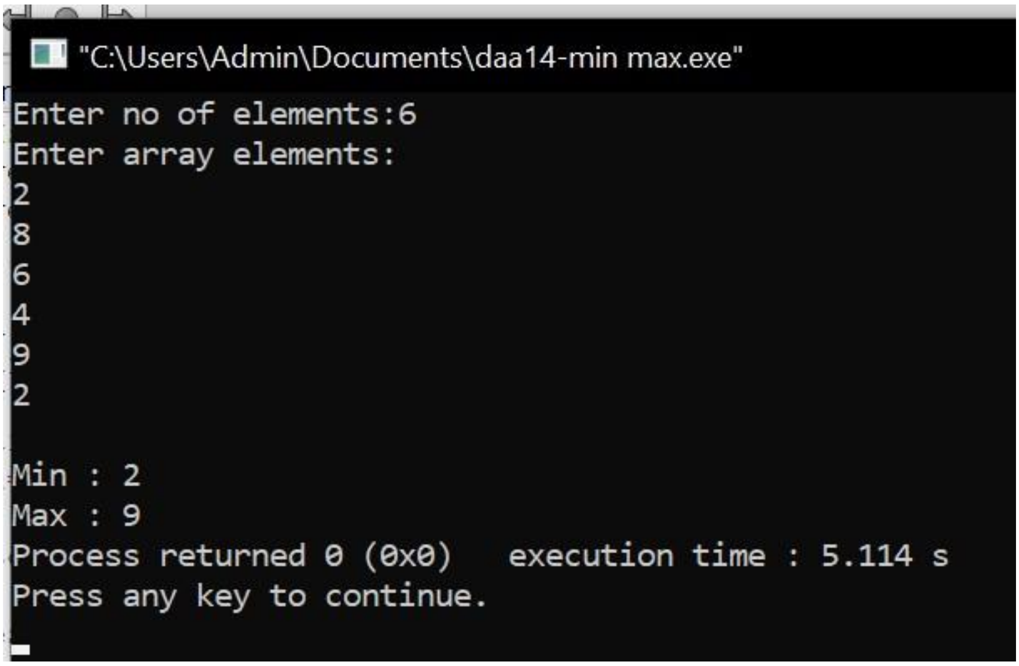
```
C:\Users\Admin\Documents\daa13-merge.exe
Enter no of elements:6
Enter array elements:
2
4
7
5
9
8
Merge Sort :
2
4
5
7
8
9

Process returned 0 (0x0)   execution time : 6.943 s
Press any key to continue.
```

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];
    }
}
```



"C:\Users\Admin\Documents\daa14-min max.exe"

```
Enter no of elements:6
Enter array elements:
2
8
6
4
9
2

Min : 2
Max : 9
Process returned 0 (0x0)   execution time : 5.114 s
Press any key to continue.
```