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)

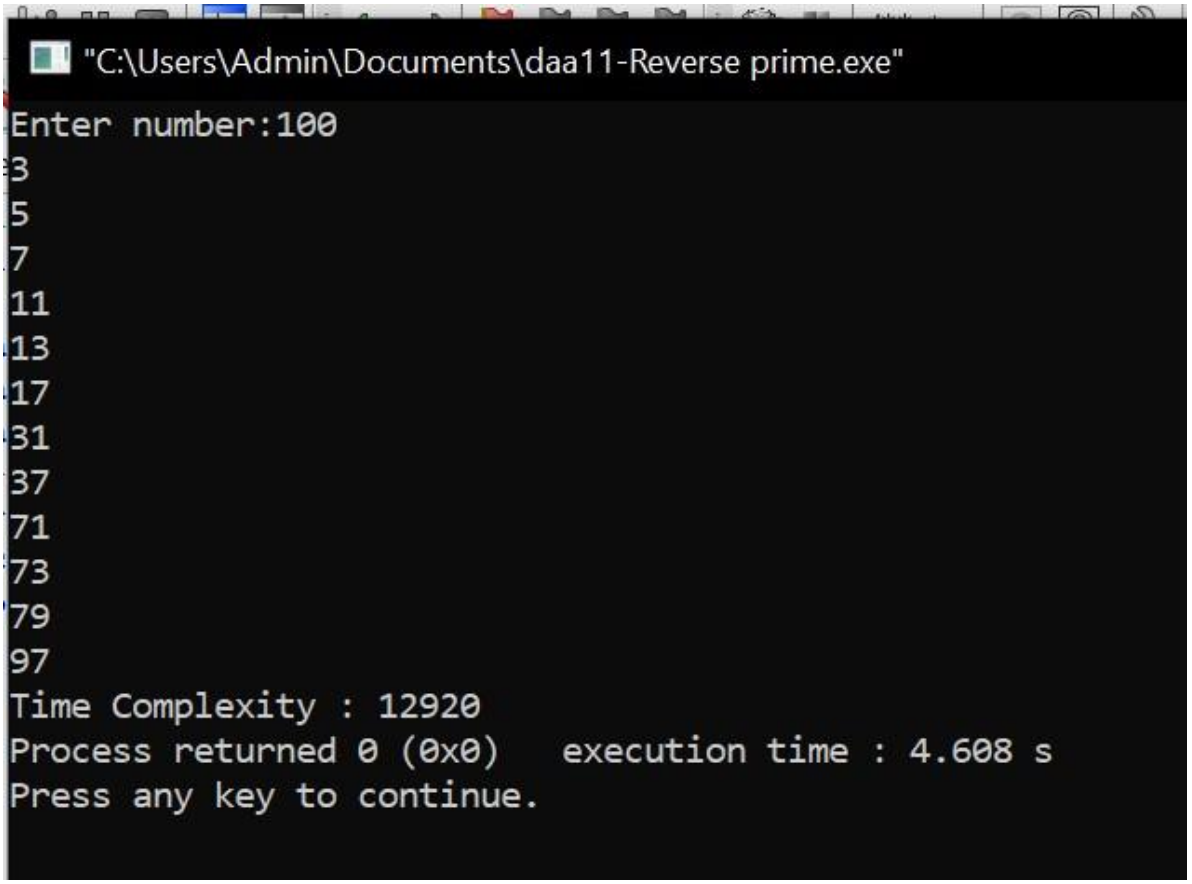
Generate all the no's upto N and estimate time complexity.

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);
}
```



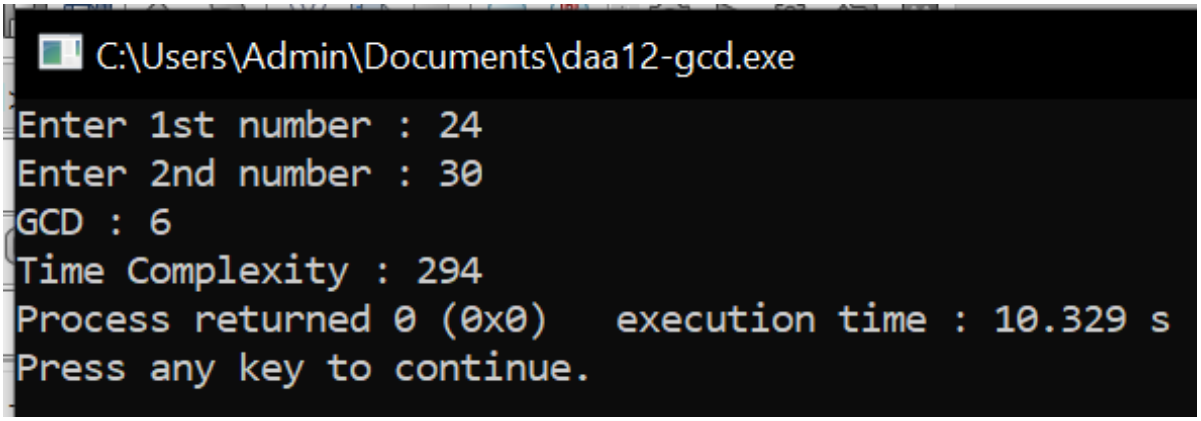
8. Compute the program to find the GCD of two numbers. And also find the finf of time Recursion used to estimate time complexity.

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++)
   {
```

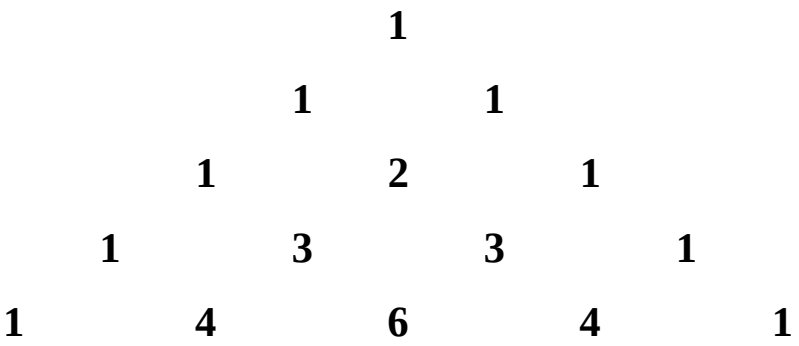
```
    c++;
    c++;
    if(b%i==0)
    {
        b1=b1+1;    c++;
        bf[b1]=i;   c++;
    }
}
c++;
c1=-1;  c++;
for(i=0;i<a1+1;i++)
{
    c++;
    for(j=0;j<b1+1;j++)
    {
        c++;
        c++;
        if(af[i]==bf[j])
        {
            g=af[i];    c++;
        }
    }
    c++;
}
c++;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

}


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.

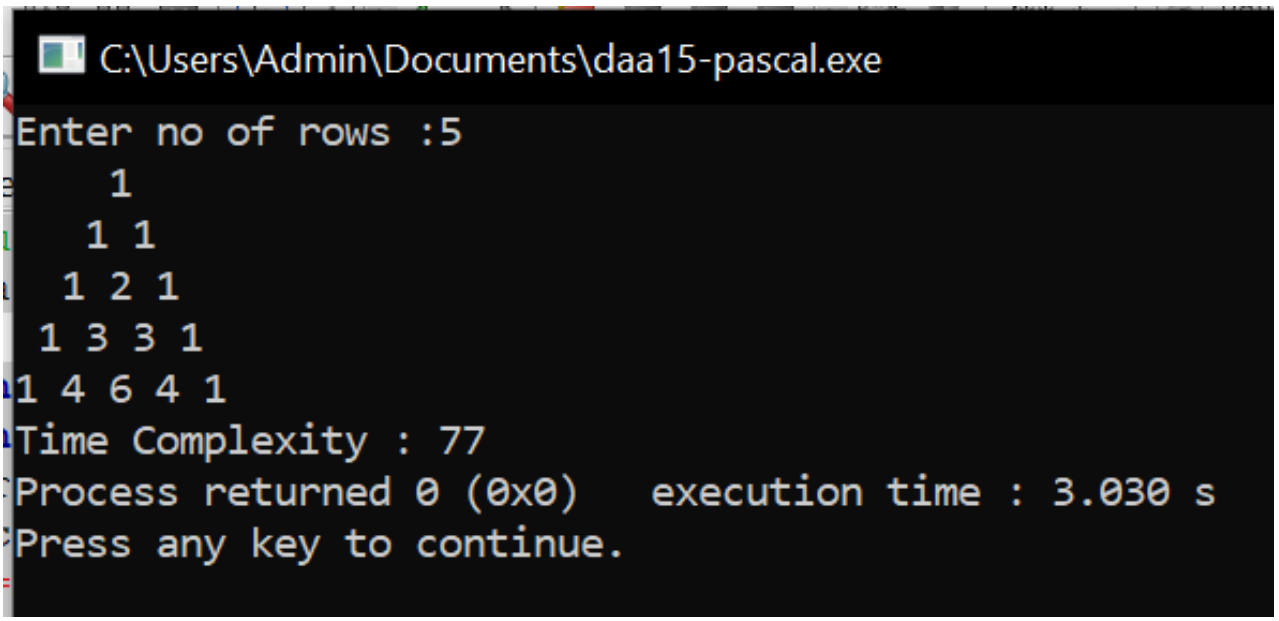
Estimate the time complexity for the row=5



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);
}
```

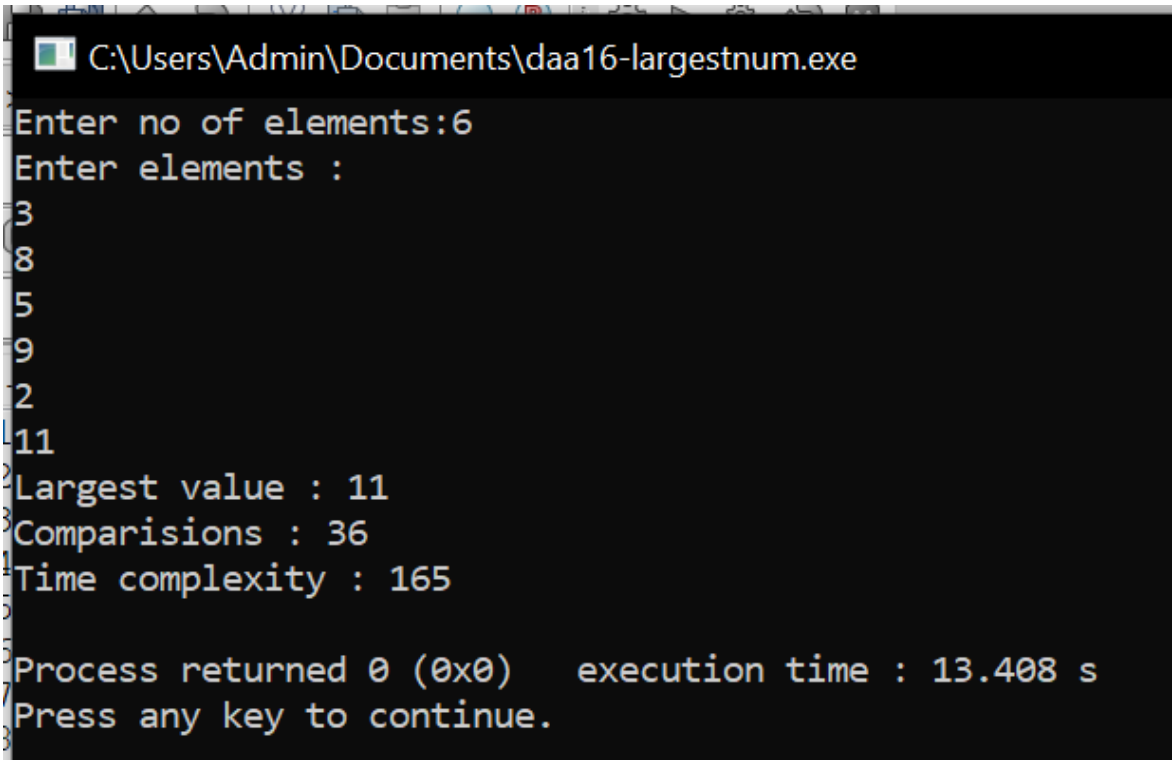


10. Write a program to find the largest element value in an array. Estimate the time complexity and no of comparison for the given set of values.

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.

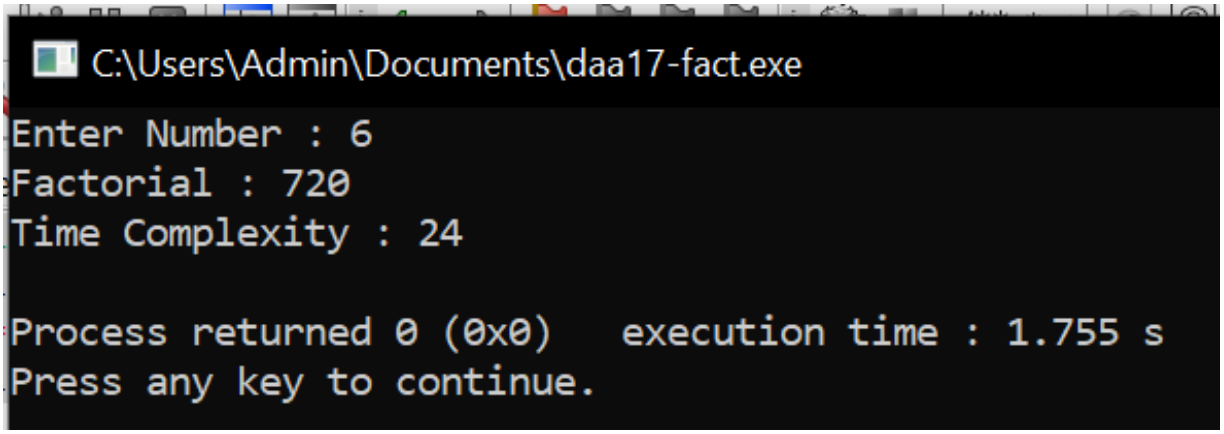
Condition such as i. n=0, return 1 otherwise fact (n-1) * n

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**

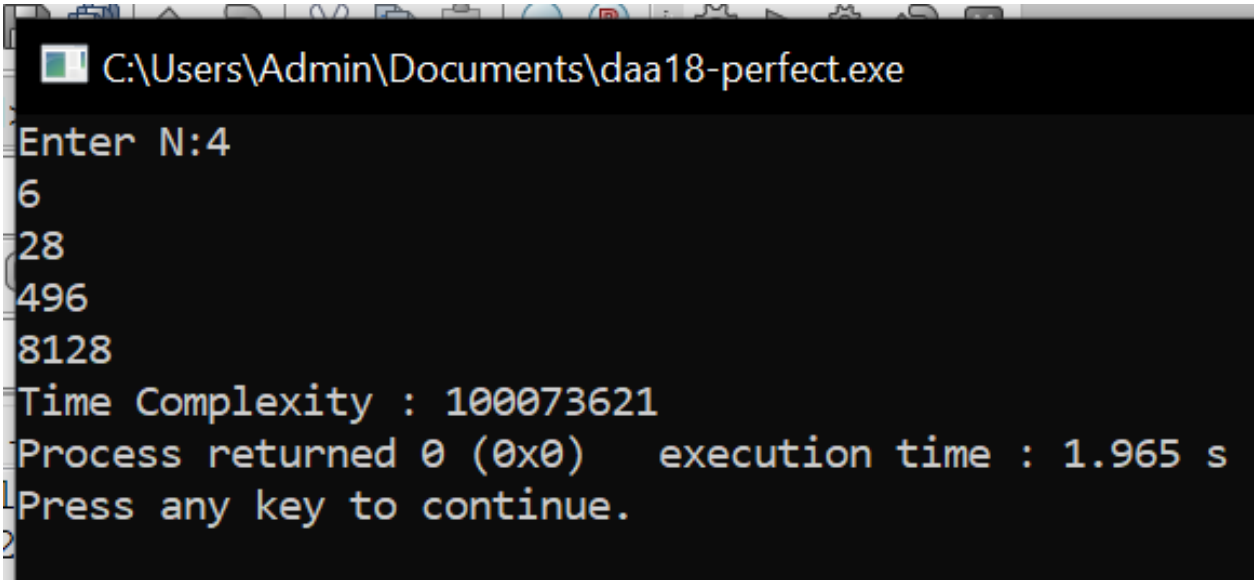
N = 0.2

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);
}
```

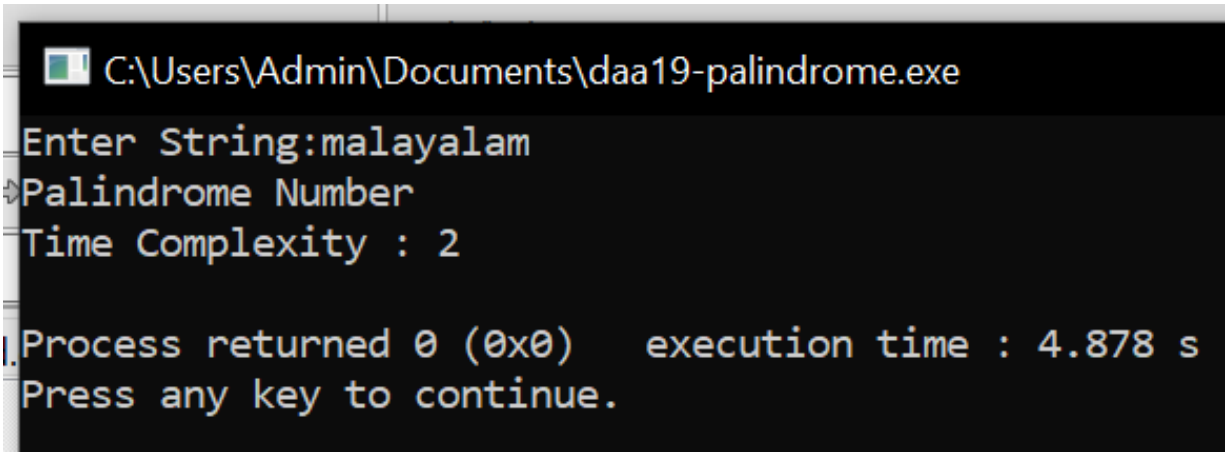


13. Write a C program to check whether is a given input is a palindrome

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 Palindrome Number");
    }
    printf("\nTime Complexity : %d\n",c);
}
```

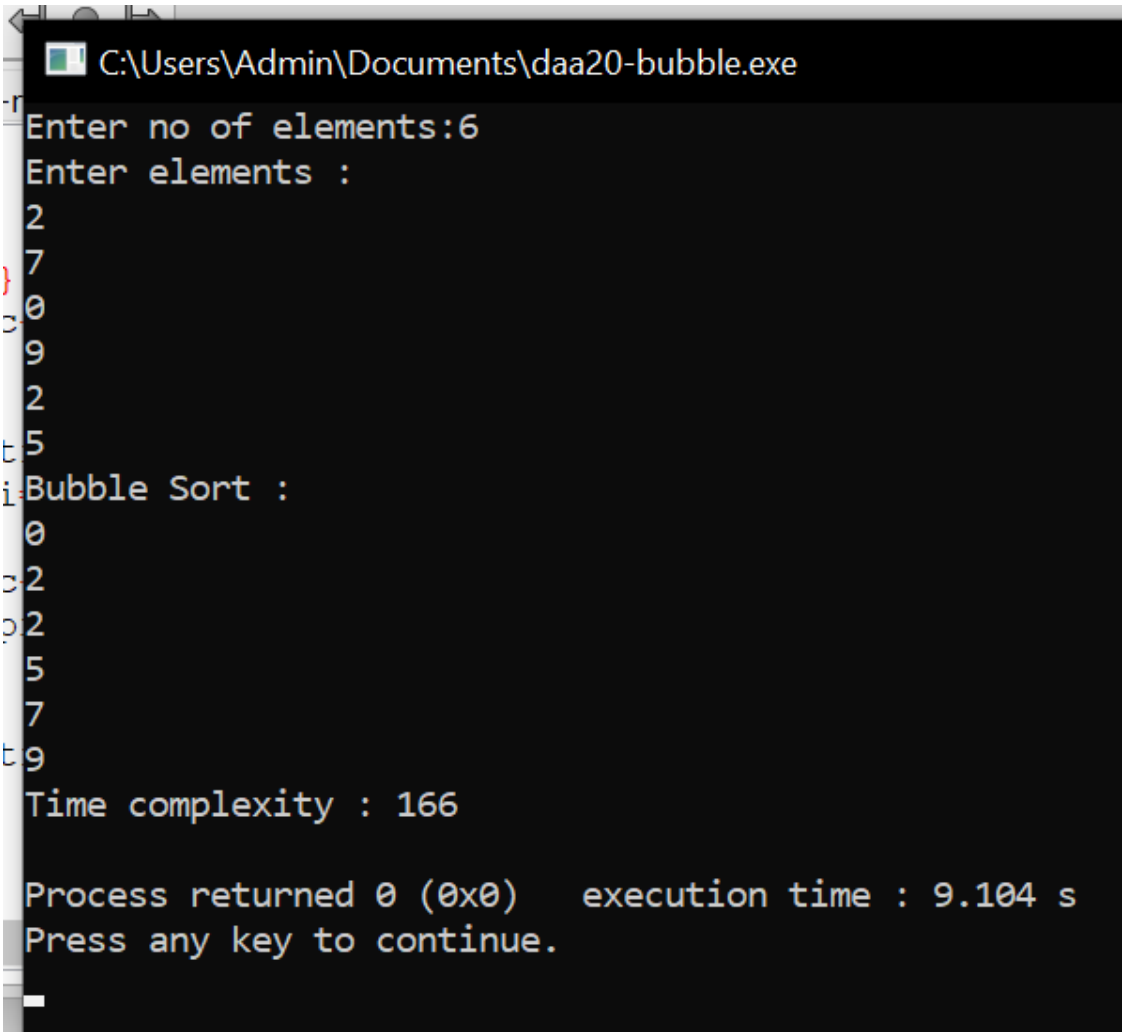


14. Write a program to perform Bubble sort and estimate time Complexity

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])
```

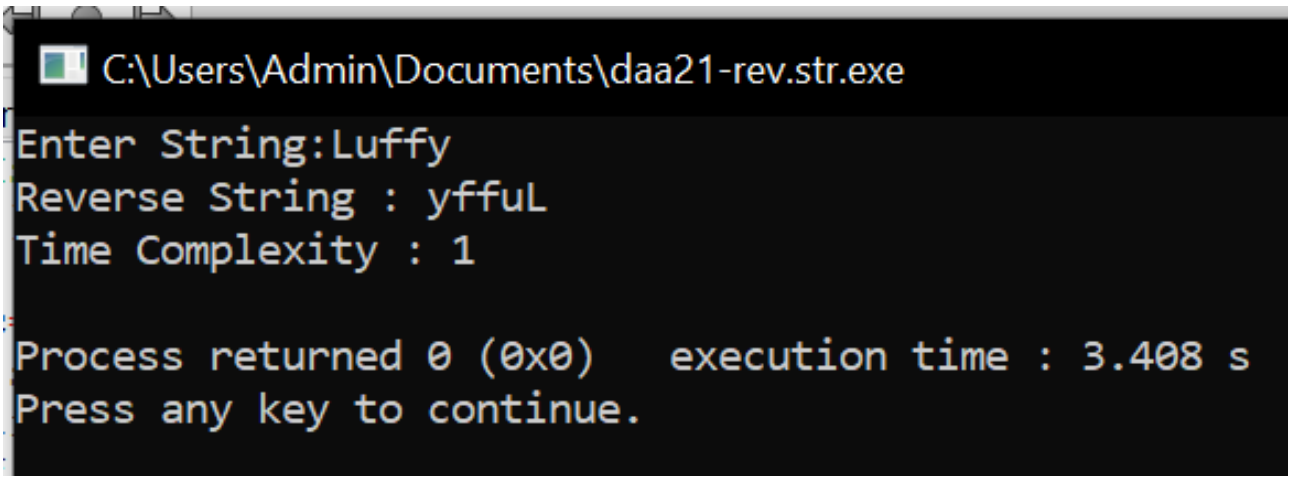
```
            {
                k=a[i]; c++;
                a[i]=a[j]; c++;
                a[j]=k; c++;
            }
        }
        c++;
    }
    c++;
    printf("Bubble Sort :\n");
    for(i=0;i<n;i++)
    {
        c++;
        printf("%d\n",a[i]);
    }
    c++;
    printf("Time complexity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


C:\Users\Admin\Documents\daa20-bubble.exe
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);
}
```

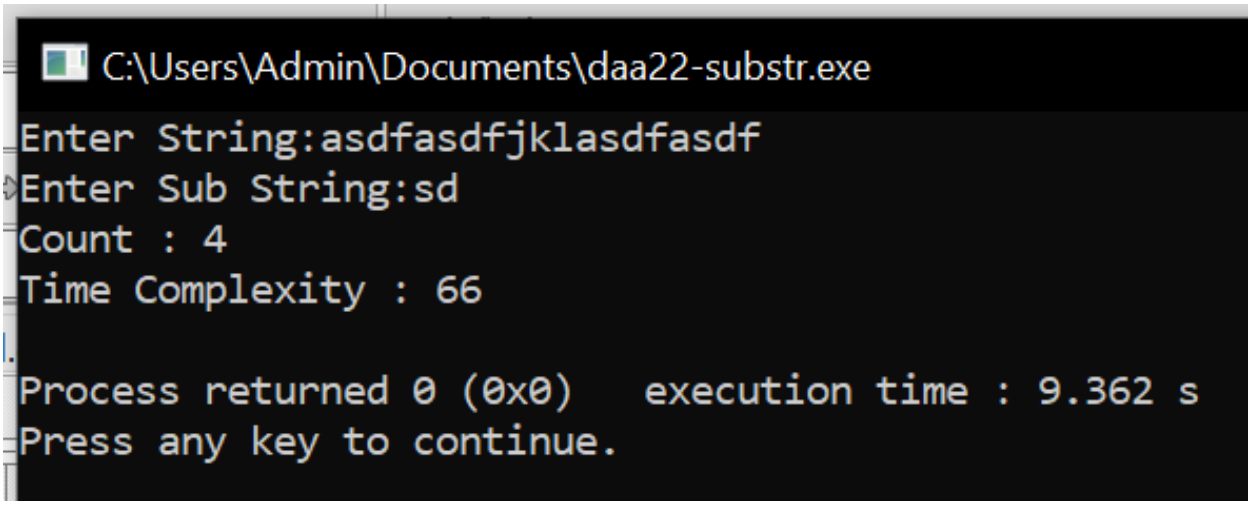


16. Write a program to check sub string is there in a string or not.

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**

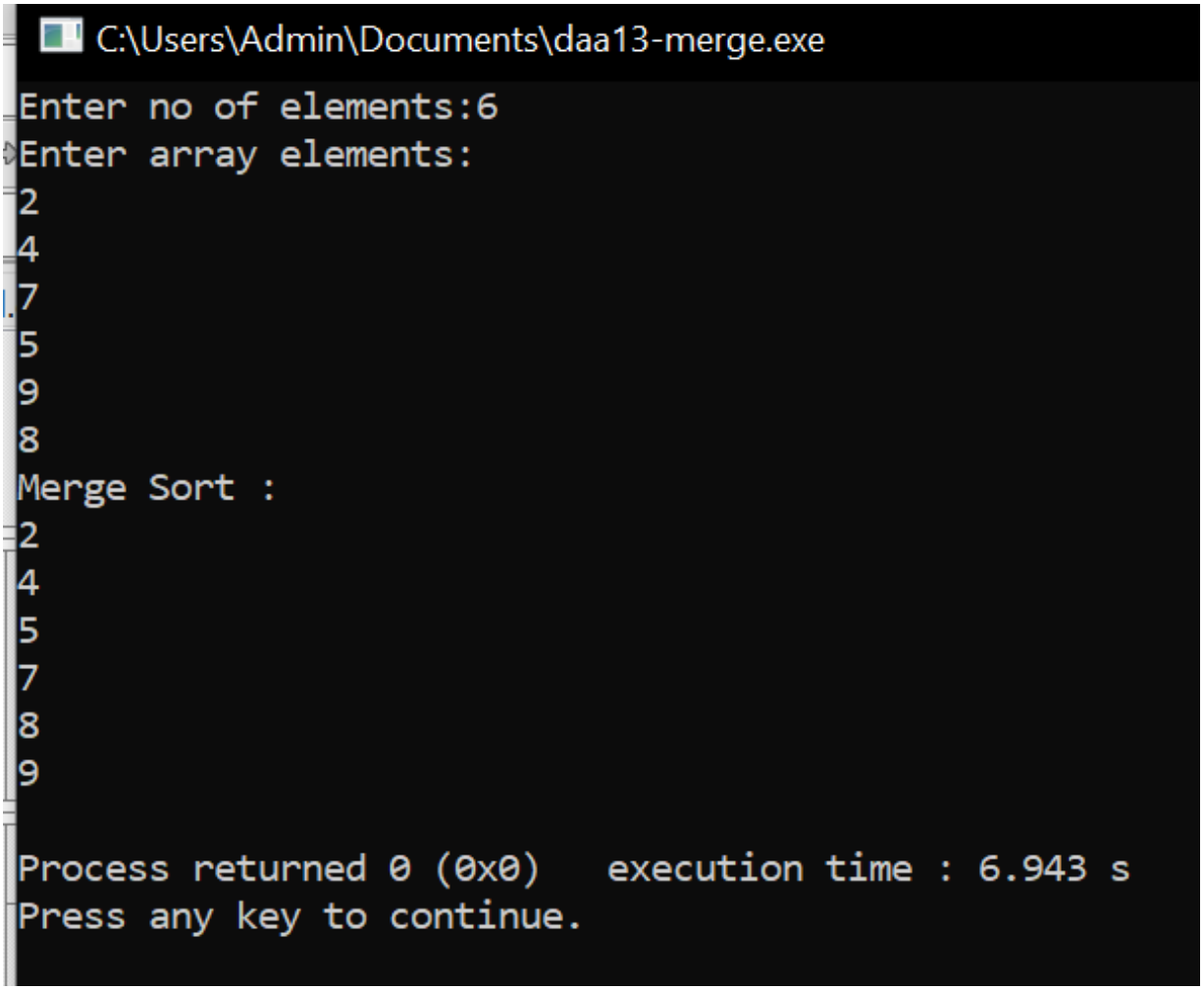
Program:

```
#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;
        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];
    }
}
```



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];
    }
}
```