Name : Sai Ram.K

ID : 20181CSE0621

Section : 5-CSE-10

Course : Analysis of Algorithms

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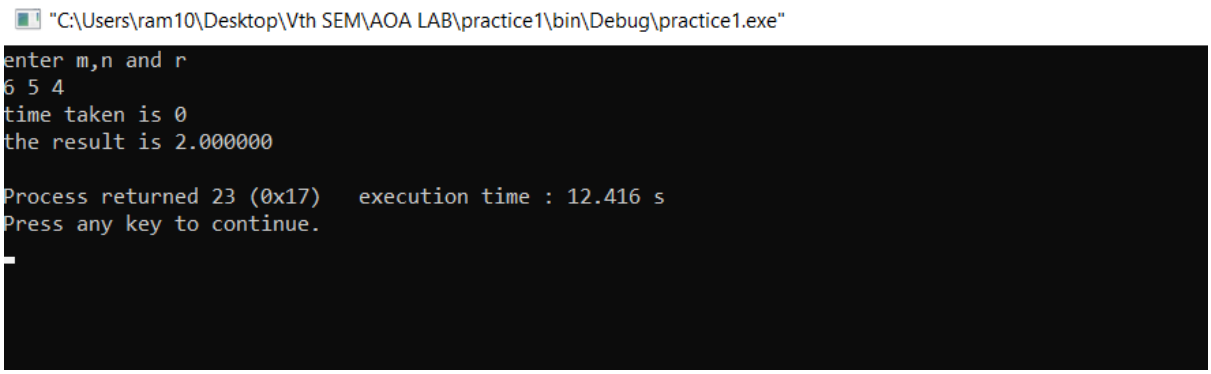
1. #include<stdio.h>

#include<time.h>

```
int fact(int n)
{
   if(n==0||n==1)
      return 1;
   else
      return (n*fact(n-1));
}
void main()
{
   int m,n,r;
   clock_t s,e;
   printf("enter m,n and r\n");
   scanf("%d%d%d",&m,&n,&r);
   if(r<=m && r<=n)
   {
   s=clock();
   int x=fact(m-r);
```

```
    int y=fact(n-r);
    float result=x/y;
    e=clock();
    printf("time taken is %lu\n",(e-s)/CLOCKS_PER_SEC);
    printf("the result is %lf\n",result);
    }
    else
        printf("factorial of negative number is not possible\n");
}
```

OUTPUT:-



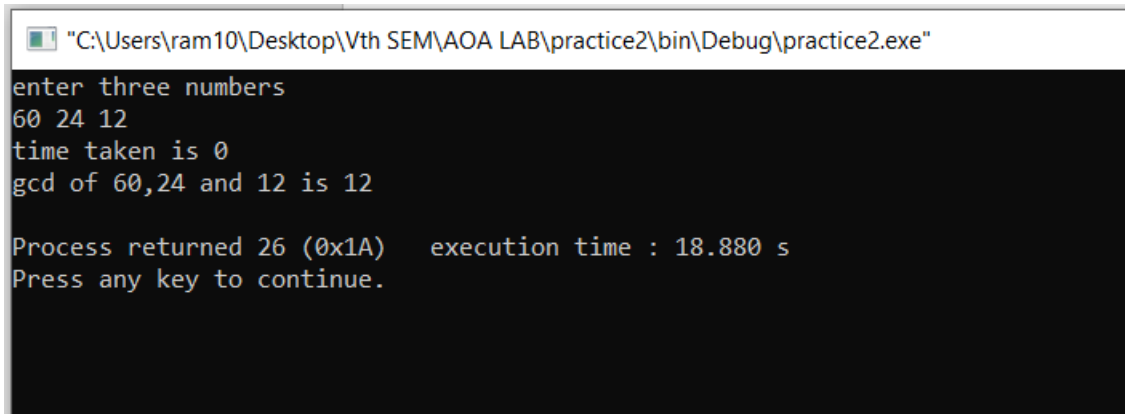
2.

```
#include<stdio.h>
#include<time.h>
int gcd(int m,int n)
{
    if(n==0)
    {
```

```
        return m;
    }
    else
        return(n,m%n);
}

void main()
{
    int a,b,c,x,y,res;
    clock_t s,e;
    printf("enter three numbers\n");
    scanf("%d%d%d",&a,&b,&c);
    s=clock();
    x=gcd(a,b);
    y=gcd(b,c);
    res=gcd(x,y);
    e=clock();
    printf("time taken is %ld\n",(e-s)/CLOCKS_PER_SEC);
    printf("gcd of %d,%d and %d is %d\n",a,b,c,res);
}
```

OUTPUT:-



3.

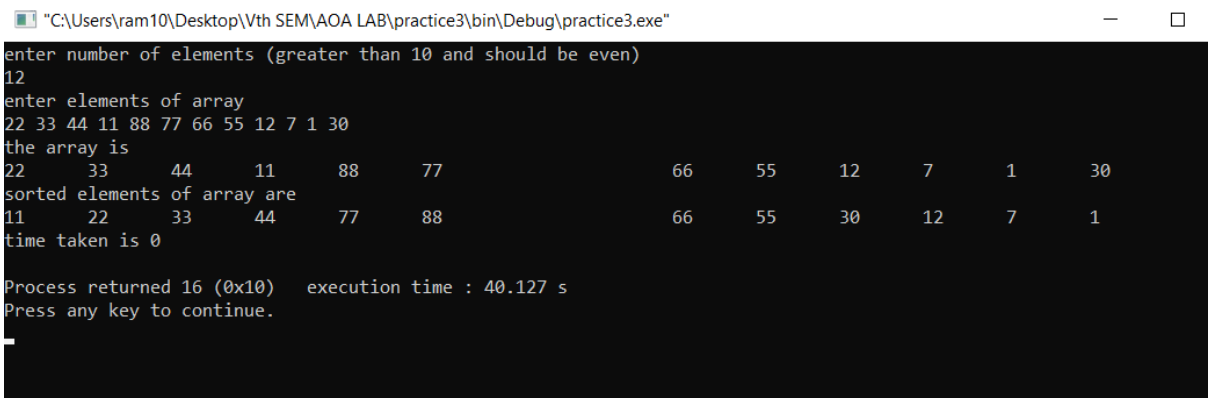
```
#include<stdio.h>
#include<time.h>
void bubblesort_asc(int a[],int n)
{
   for(int i=0;i<n-1;i++)
   {
      for(int j=0;j<n-i-1;j++)
      {
         if(a[j]>a[j+1])
         {
            int temp;
            temp=a[j];
            a[j]=a[j+1];
```

```
            a[j+1]=temp;
        }
    }
  }
}
void bubblesort_desc(int a[],int n)
{
  for(int i=0;i<n-1;i++)
  {
    for(int j=0;j<n-i-1;j++)
    {
      if(a[j]<a[j+1])
      {
        int temp;
        temp=a[j];
        a[j]=a[j+1];
        a[j+1]=temp;
      }
    }
  }
}
void main()
{
  int n;
  clock_t s,e,t;
```

```
    printf("enter number of elements (greater than 10 and should be
even)\n");
    scanf("%d",&n);
    if(n>10 && n%2==0)
    {
    int a[n];
    printf("enter elements of array\n");
    for(int i=0;i<n;i++)
    {
       scanf("%d",&a[i]);
    }
    int a1[n/2],a2[n/2];
    for(int i=0;i<n/2;i++)
    {
       a1[i]=a[i];
       a2[i]=a[i+n/2];
    }
    s=clock();
    printf("the array is\n");
    for(int i=0;i<n/2;i++)
    {
       printf("%d\t",a1[i]);
    }
    printf("\t\t");
    for(int i=0;i<n/2;i++)
```

```
    {
        printf("%d\t",a2[i]);
    }
    printf("\n");
    bubblesort_asc(a1,n/2);
    bubblesort_desc(a2,n/2);
    e=clock();
    t=(e-s)/CLOCKS_PER_SEC;
    printf("sorted elements of array are\n");
    for(int i=0;i<n/2;i++)
    {
        printf("%d\t",a1[i]);
    }
    printf("\t\t");
    for(int i=0;i<n/2;i++)
    {
        printf("%d\t",a2[i]);
    }
    printf("\n");
    printf("time taken is %ld\n",t);
    }
    else
        printf("size of array is either less than 10 or is not even, hence
program terminated\n");
}
```

OUTPUT:-

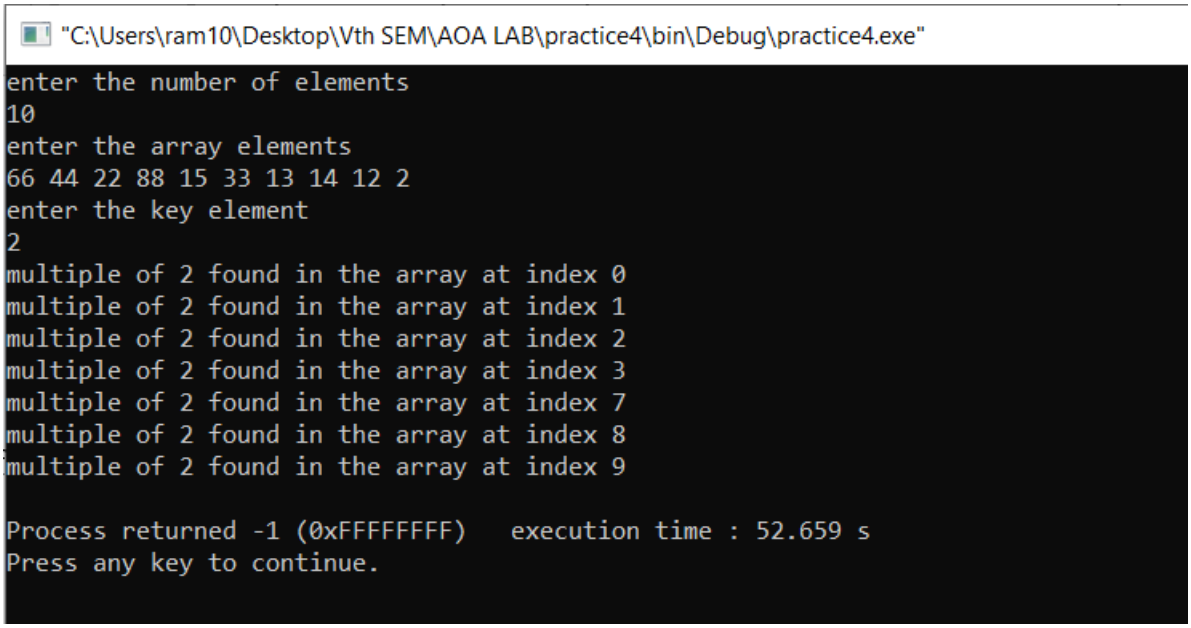


4.

```
#include<stdio.h>
#include<time.h>
void main()
{
    int n,key;
    clock_t s,e;
    int flag=0;
    printf("enter the number of elements\n");
    scanf("%d",&n);
    int a[n];
    printf("enter the array elements\n");
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
```

```
    }
    printf("enter the key element\n");
    scanf("%d",&key);
    s=clock();
    for(int i=0;i<n;i++)
    {
        if(a[i] % key==0)
        {
            flag=1;
            printf("multiple of %d found in the array at index
%d\n",key,i);
        }
    }
    e=clock();
    if(flag==0)
        printf("neither key nor multiple of key is present in the array\n");
    printf(("total time taken is %ld\n",(e-s)/CLOCKS_PER_SEC));
}
```

Output:-


"C:\Users\ram10\Desktop\Vth SEM\AOA LAB\practice4\bin\Debug\practice4.exe"
enter the number of elements
10
enter the array elements
66 44 22 88 15 33 13 14 12 2
enter the key element
2
multiple of 2 found in the array at index 0
multiple of 2 found in the array at index 1
multiple of 2 found in the array at index 2
multiple of 2 found in the array at index 3
multiple of 2 found in the array at index 7
multiple of 2 found in the array at index 8
multiple of 2 found in the array at index 9
Process returned -1 (0xFFFFFFFF) execution time : 52.659 s
Press any key to continue.