Lab Report

Course Code: CSE-114

Course Title: Problem Solving Lab

Topic: Array

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Department of CSE ,

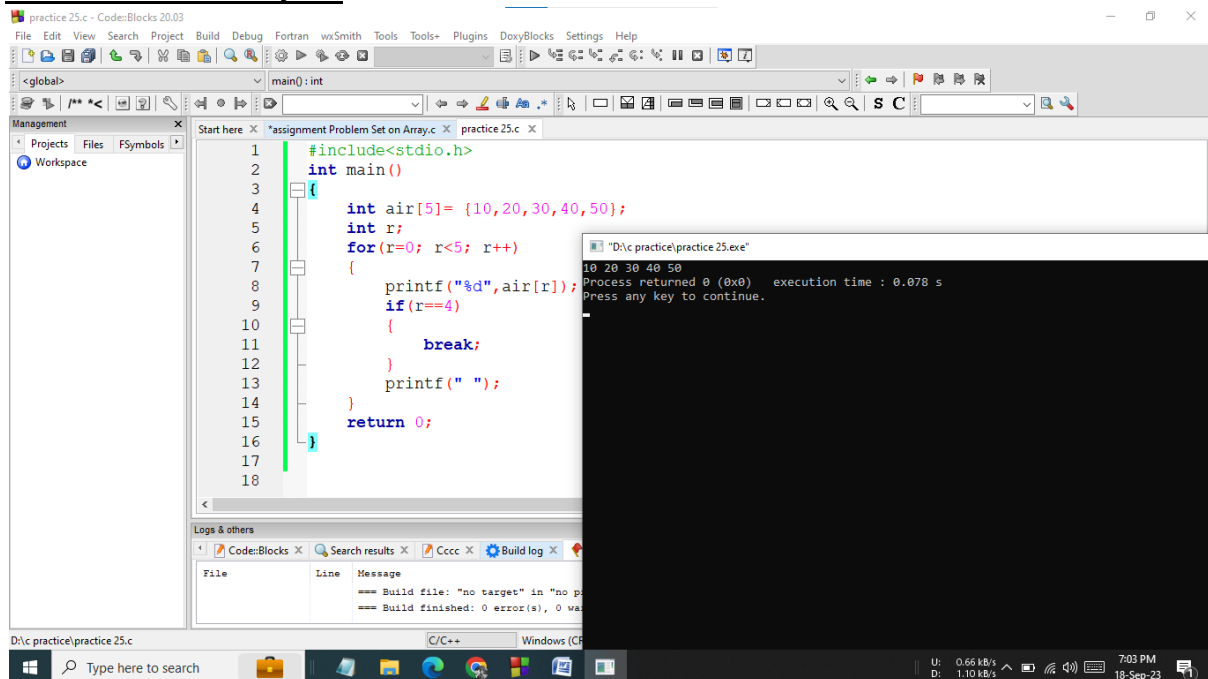Daffodil International University, Ashulia, Dhaka.

Problem No: 1

Problem Name: Write a c program, declare an array with a size of 5. Store 10, 20, 30, 40 and 50 in it and print them as output.

Source Code:

```c
#include<stdio.h>
int main()
{
 int air[5]= {10,20,30,40,50};
int r;
for(r=0; r<5; r++)
{
printf("%d",air[r]);
if(r==4)
{
break;
}
printf(" ");
}
return 0;
}
```

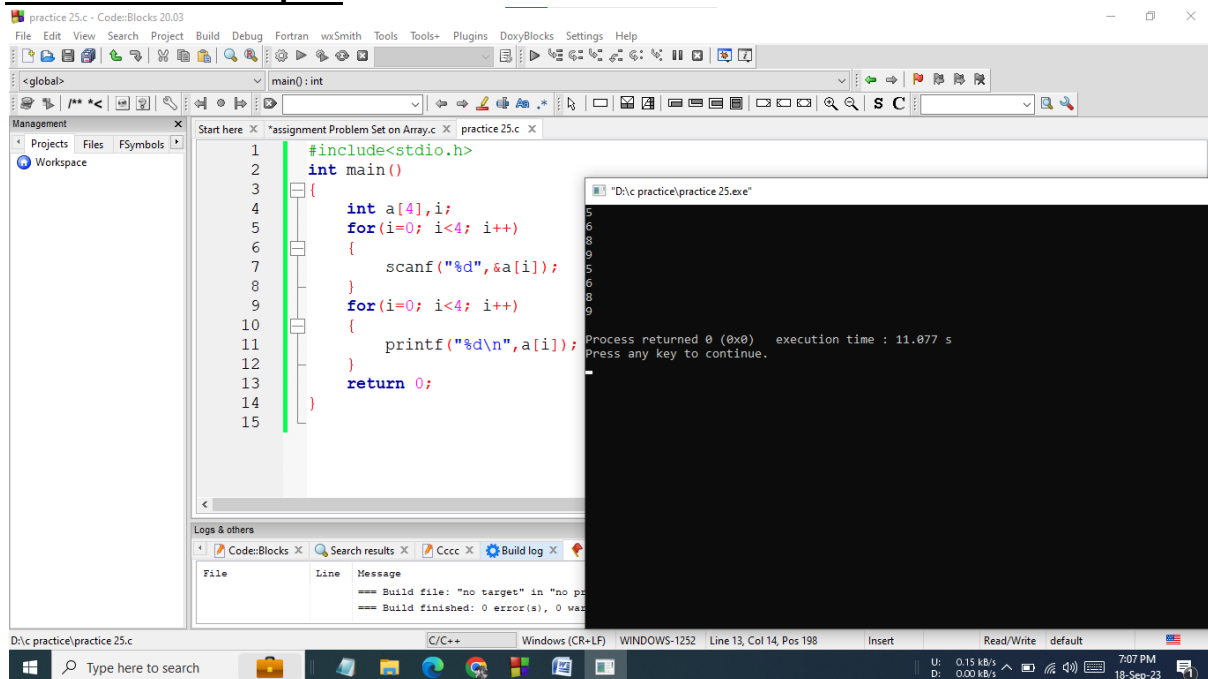## Screenshot of output:

Hand Written Code :

Problem No: 2

Problem Name: Write a C program to take 4 size array and array elements from the user ,and print them.

Source Code:

```c
#include<stdio.h>
int main()
{
    int a[4],i;
    for(i=0; i<4; i++)
    {
        scanf("%d",&a[i]);
    }
    for(i=0; i<4; i++)
    {
        printf("%d\n",a[i]);
    }
    return 0;
}
```
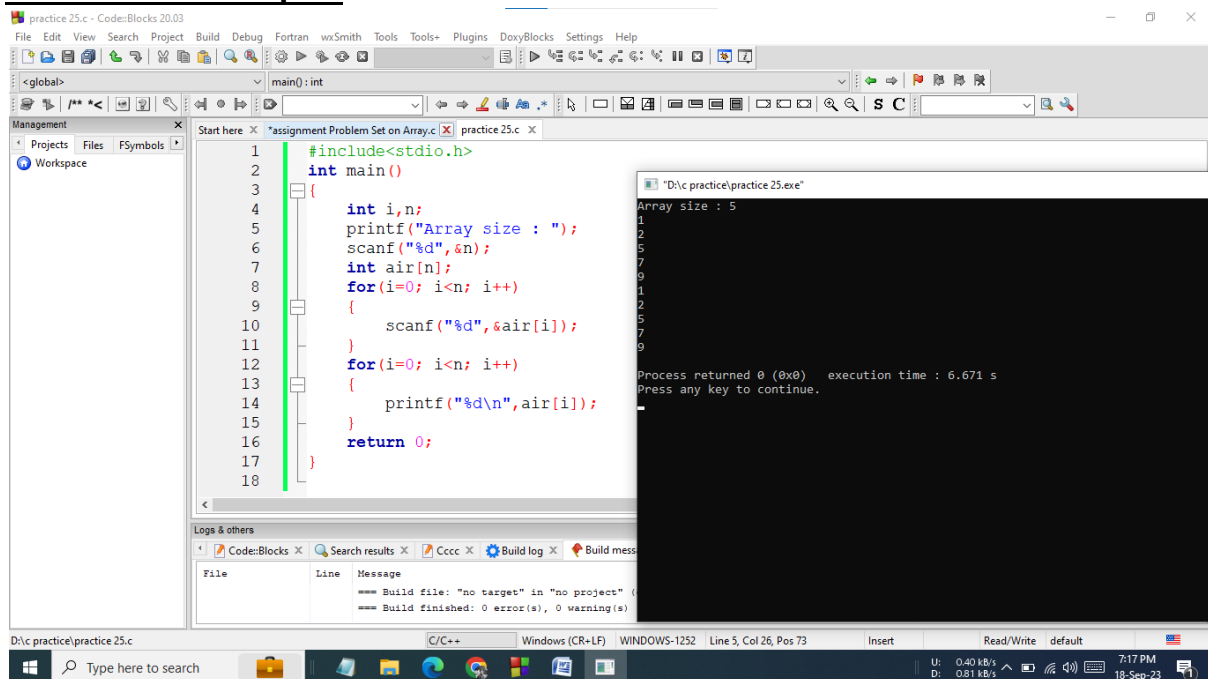
Screenshot of output:

Hand Written Code :
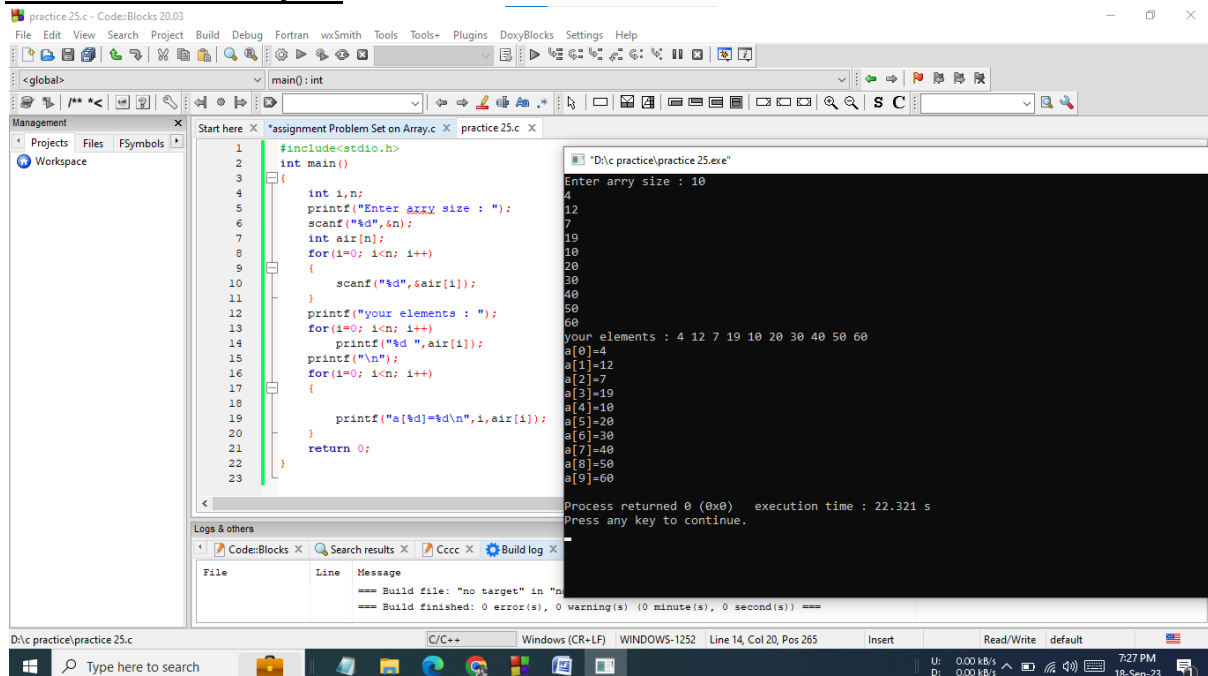
Problem No: 3

Problem Name: Take a n size array and take the array element from the user and print them.

Source Code:

```c
#include<stdio.h>
int main()
{
    int i,n;
    printf("Array size : ");
    scanf("%d",&n);
    int air[n];
    for(i=0; i<n; i++)
    {
        scanf("%d",&air[i]);
    }
    for(i=0; i<n; i++)
    {
        printf("%d\n",air[i]);
    }
    return 0;
}
```
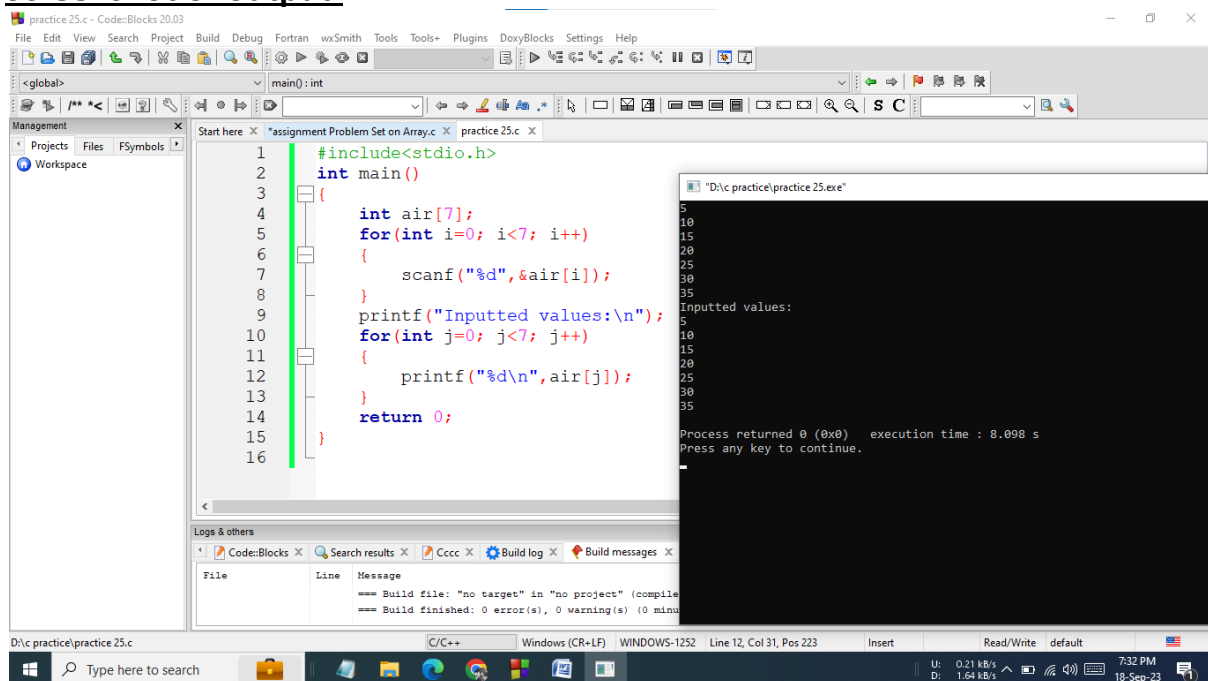
Screenshot of output:

Hand Written Code :

Problem No: 4

Problem Name: Take a n size array and take the array element from the user and print them.

Source Code:

```c
#include<stdio.h>
int main()
{
    int i,n;
    printf("Enter arry size : ");
    scanf("%d",&n);
    int air[n];
    for(i=0; i<n; i++)
    {
        scanf("%d",&air[i]);
    }
    printf("your elements : ");
    for(i=0; i<n; i++)
        printf("%d ",air[i]);
    printf("\n");
    for(i=0; i<n; i++)
    {
        printf("a[%d]=%d\n",i,air[i]);
    }
    return 0;
}
```

Screenshot of output:

Hand Written Code :

Problem No: 5

Problem Name: Write a C program to take 7 values from the user in an array. Use a loop to input those values from the user. As output, print those values.

Source Code:

```c
#include<stdio.h>
int main()
{
    int air[7];
    for(int i=0; i<7; i++)
    {
        scanf("%d",&air[i]);
    }
    printf("Inputted values:\n");
    for(int j=0; j<7; j++)
    {
        printf("%d\n",air[j]);
    }
    return 0;
}
```

Screenshot of output:

Hand Written Code :

Problem No: 6

Problem Name: Take a N size array from the user and array input take from the user and print it in the reverse way.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n;
    printf("size : ");
    scanf("%d",&n);
    int air[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&air[i]);
    }
    for(int i=n-1; i>=0; i--)
    {
        printf("%d\n",air[i]);
    }
    return 0;
}
```
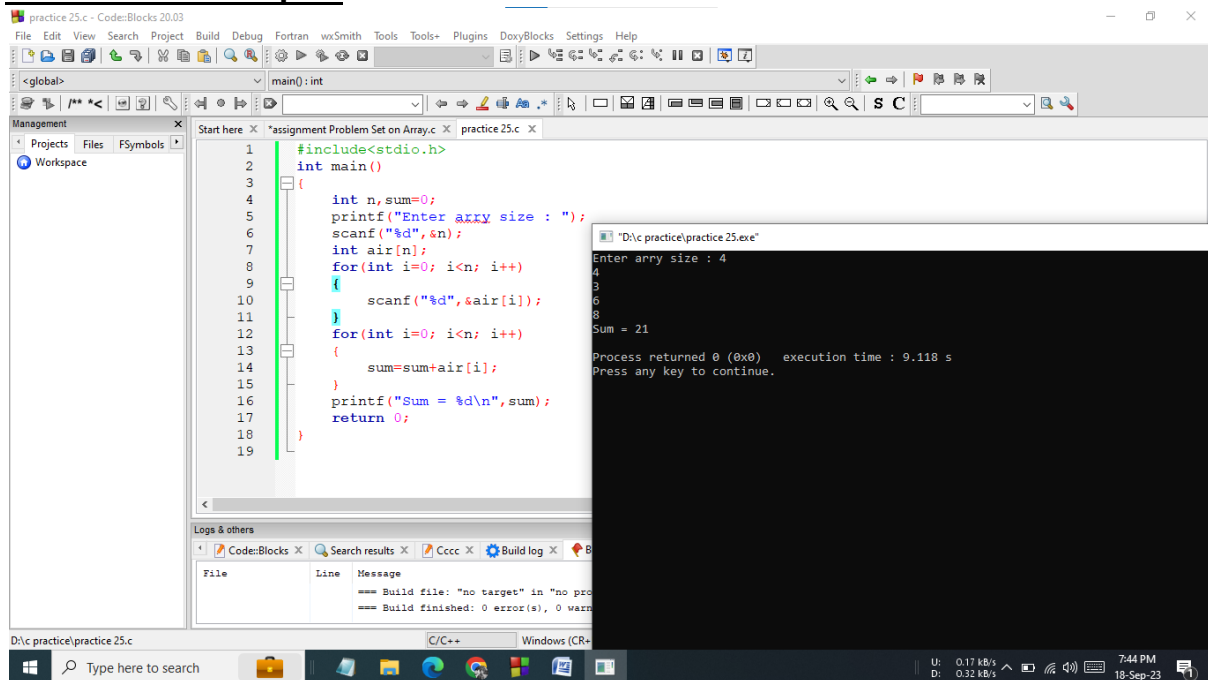
Screenshot of output:
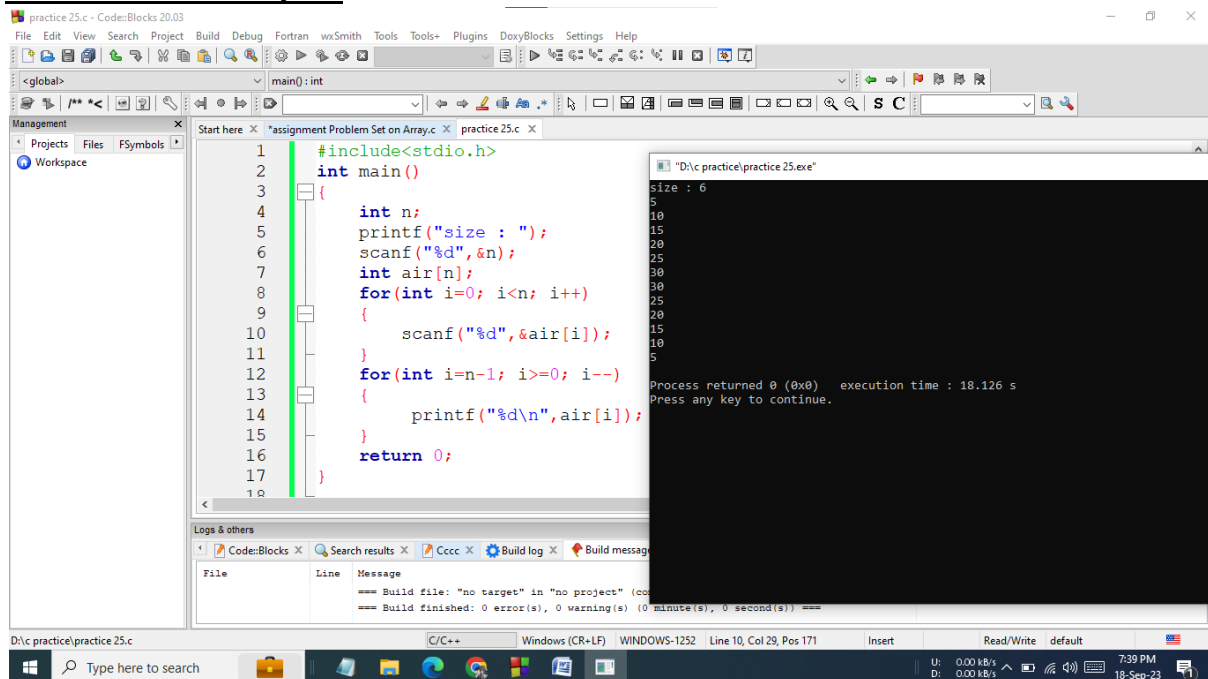
Hand Written Code :

Problem No: 7

Problem Name: Write a c program to take N user input in an array and print the sum of those N values.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,sum=0;
    printf("Enter arry size : ");
    scanf("%d",&n);
    int air[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&air[i]);
    }
    for(int i=0; i<n; i++)
    {
        sum=sum+air[i];
    }
    printf("Sum = %d\n",sum);
    return 0;
}
```

Screenshot of output:

Hand Written Code :
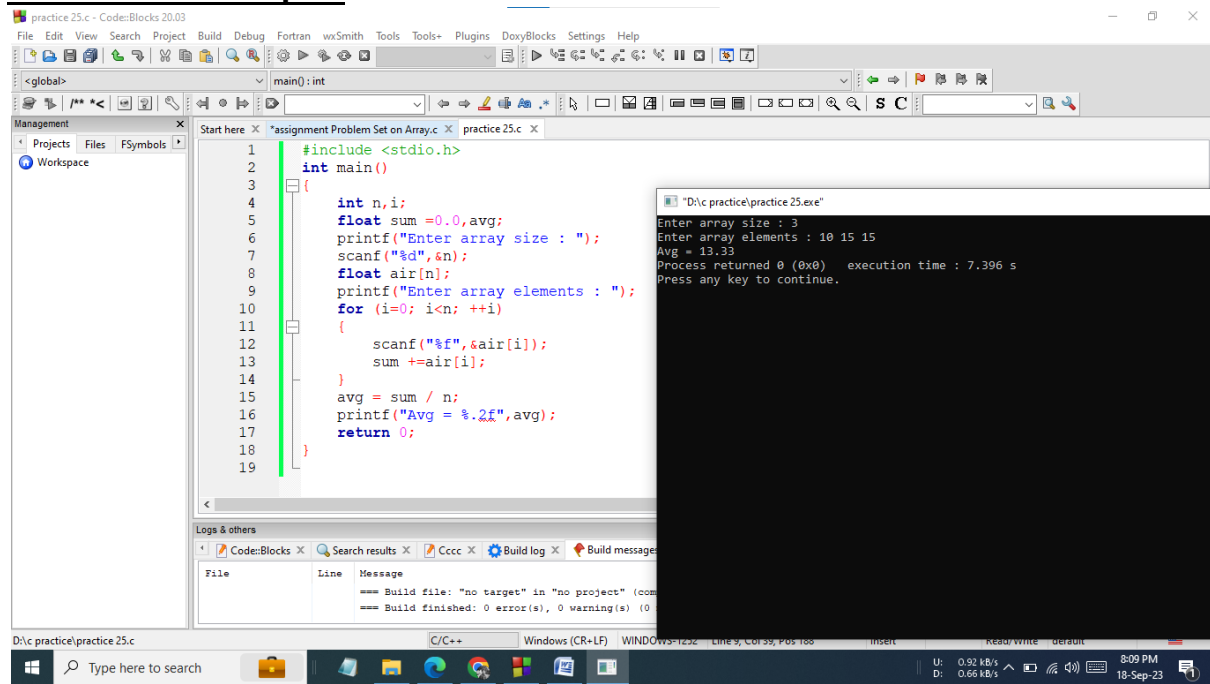
Problem No: 8

Problem Name: Write a C program that would calculate the average of all the elements in an array array size and array input taken from the user .

Source Code:

```c
#include <stdio.h>
int main()
{
    int n,i;
    float sum =0.0,avg;
    printf("Enter array size : ");
    scanf("%d",&n);
    float air[n];
    printf("Enter array elements : ");
    for (i=0; i<n; ++i)
    {
        scanf("%f",&air[i]);
        sum +=air[i];
    }
    avg = sum / n;
    printf("Avg = %.2f",avg);
    return 0;
}
```

Screenshot of output:

Hand Written Code

Problem No: 9
Problem Name: Write a C program to find the maximum value in an array
 ## Source Code:
```c
#include<stdio.h>
int main()
{
    int n,max;
    printf("Enter arry size : ");
    scanf("%d",&n);
    int a[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    max=a[0];
    for(int i=0; i<n; i++)
    {
        if(a[i]>max)
        {
            max=a[i];
        }
    }
    printf("Maximum:%d",max);
    return 0;
}
```
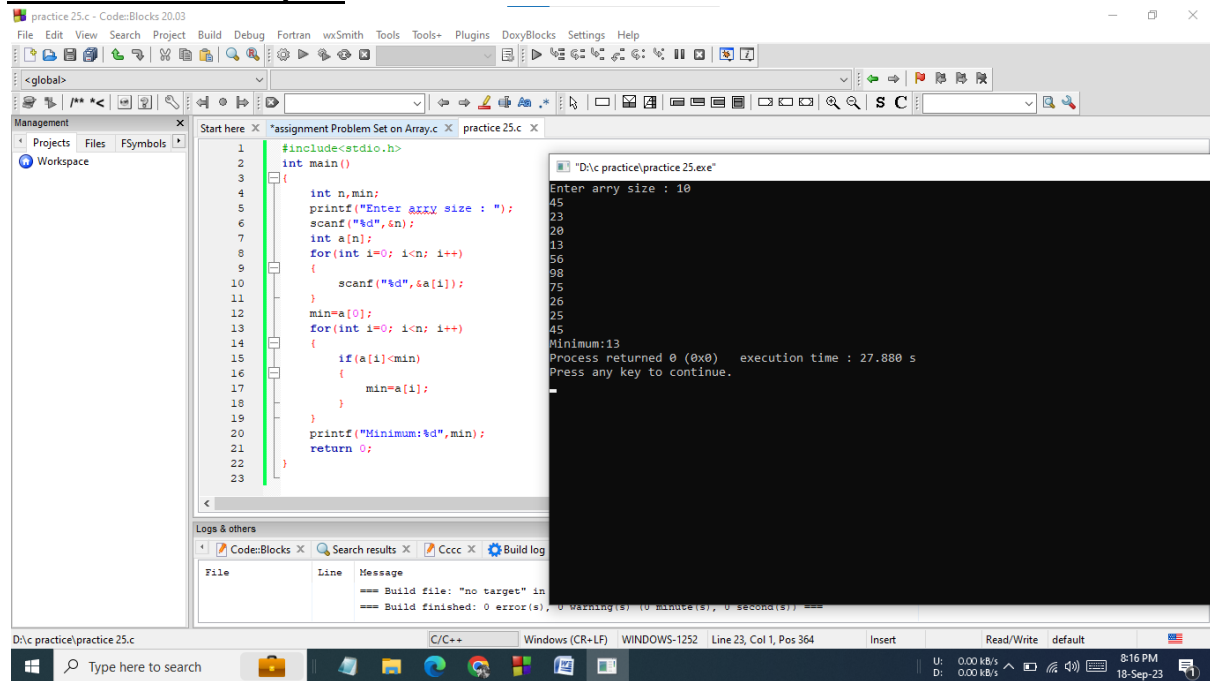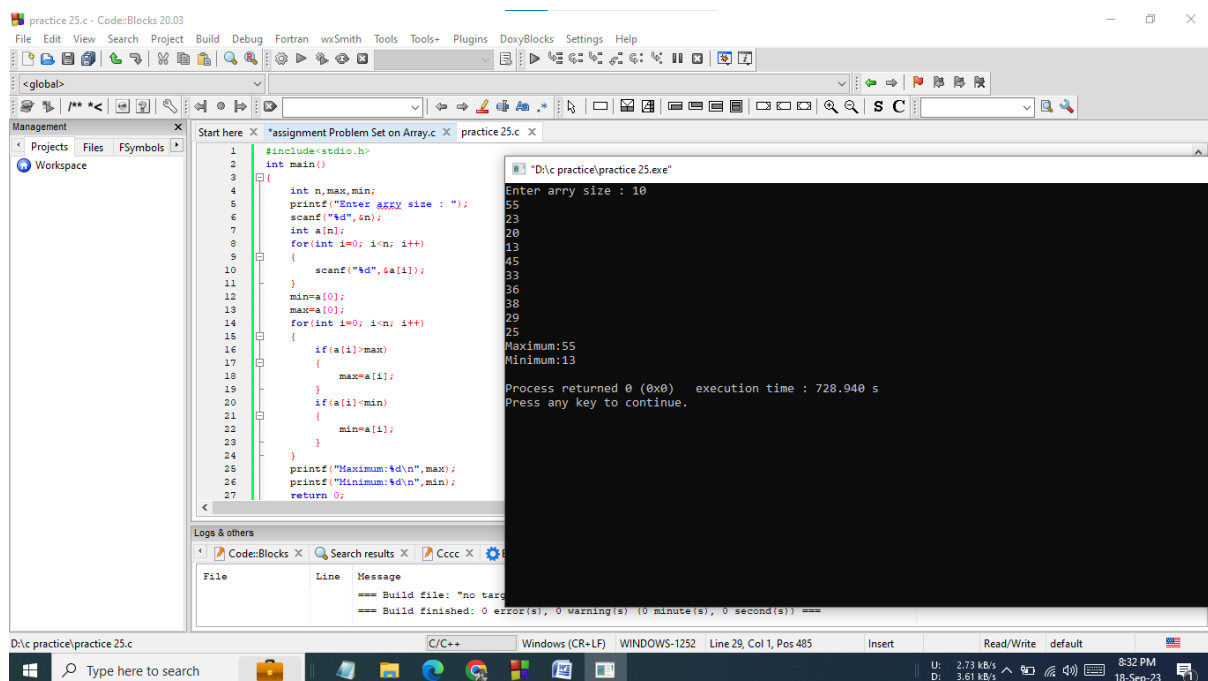
Screenshot of output:
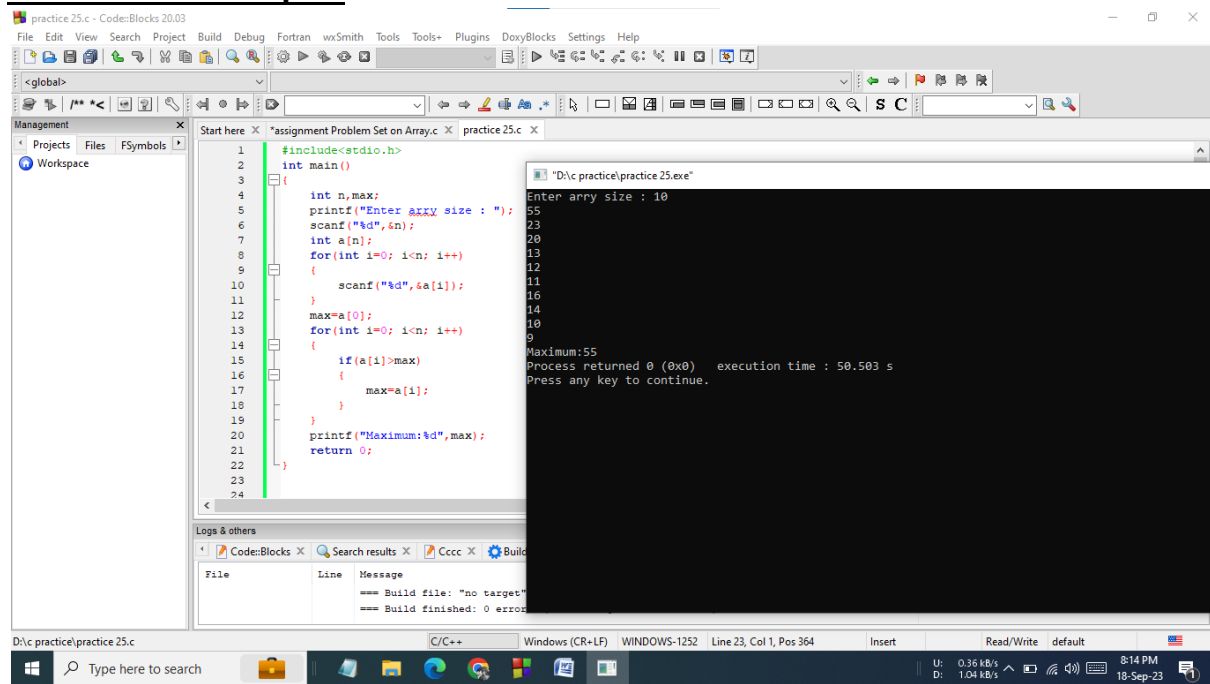
Hand Written Code:

Problem No: 10

Problem Name: Write a C program to find the minimum value in an array.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,min;
    printf("Enter arry size : ");
    scanf("%d",&n);
    int a[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    min=a[0];
    for(int i=0; i<n; i++)
    {
        if(a[i]<min)
        {
            min=a[i];
        }
    }
    printf("Minimum:%d",min);
    return 0;
}
```

Screenshot of output:

Hand Written Code:

Problem No: 11

Problem Name: Write a program in C to find the maximum and minimum element in an array.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,max,min;
    printf("Enter arry size : ");
    scanf("%d",&n);
    int a[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    min=a[0];
    max=a[0];
    for(int i=0; i<n; i++)
    {
        if(a[i]>max)
            max=a[i];
        if(a[i]<min)
            min=a[i];
    }
    printf("Maximum:%d\n",max);
    printf("Minimum:%d\n",min);
    return 0;
}
```

Screenshot of output:

Hand Written Code:

Problem No: 12

Problem Name: Take a N size array and all array input from the user and also take an integer x and find whether the x exists in the array or not.If the x exists in array print YES otherwise print NO.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,i;
    printf("Enter array size : ");
    scanf("%d",&n);
    int a[n],found,search;
    printf("Enter arry elements : ");
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    printf("Finding value : ");
    scanf("%d",&search);
    found=0;
    for(i=0; i<n; i++)
    {
        if(a[i]==search)
        {
            found=1;
            break;
        }
    }
    if(found==1)
    {
        printf("YES");
    }
    else
    {
        printf("NO");
    }
    return 0;
}
```

Screenshot of output:
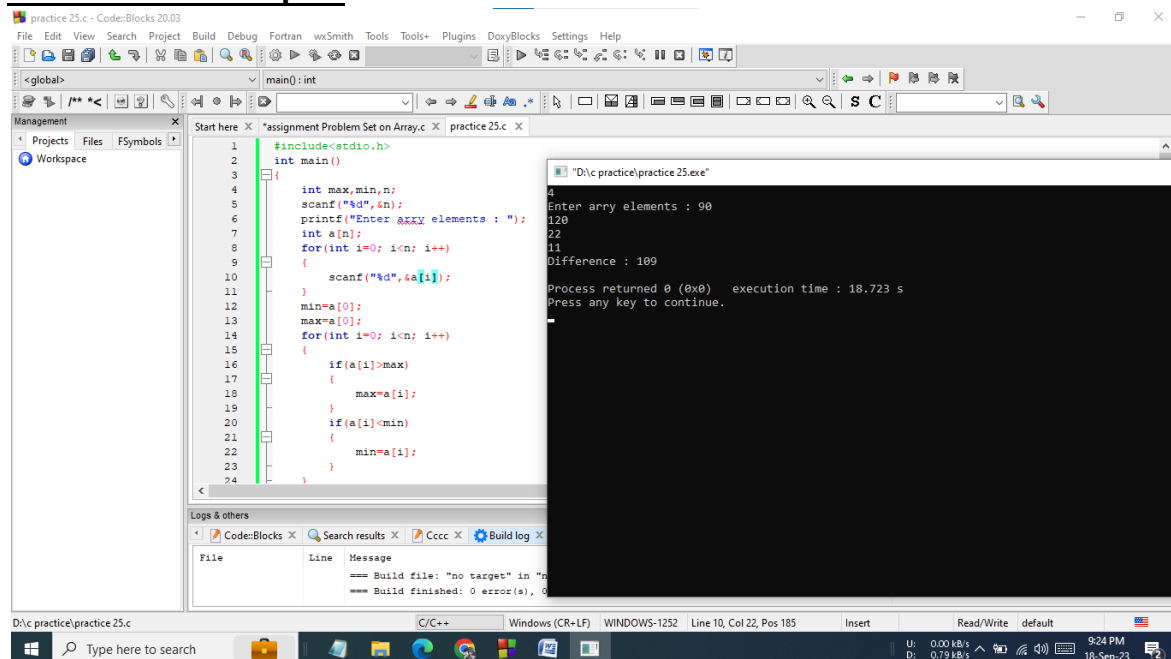

Hand Written Code:

Problem No: 13

Problem Name: Write a C program that would find the difference between the minimum and the maximum number in an array size and element taken from the user.

Source Code:

```c
#include<stdio.h>
int main()
{
    int max,min,n;
    scanf("%d",&n);
    printf("Enter arry elements : ");
    int a[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    min=a[0];
    max=a[0];
    for(int i=0; i<n; i++)
    {
        if(a[i]>max)
            max=a[i];
        if(a[i]<min)
            min=a[i];
    }
    int dif;
    dif=max-min;
    printf("Difference : %d\n",dif);
    return 0;
}
```

## Screenshot of output:

Hand Written Code:

Problem No: 14

Problem Name: Write a program in C to find the second largest element in an array

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,max1,max2,temp=0;
    printf("Enter array size : ");
    scanf("%d",&n);
    printf("Enter arry elements : ");
    int a[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&a[i]);}
    max1=a[0];
    max2=a[1];
    if(max2>max1)
    {
        temp=max1;
        max1=max2;
        max2=temp;
    }
    for(int i=2; i<n; i++)
    {
        if(a[i]>max1){
            max2=max1;
            max1=a[i];}
        else if(a[i]>=max2)
            max2=a[i];
    printf("Second Max:%d\n",max2);
    return 0;
}
```
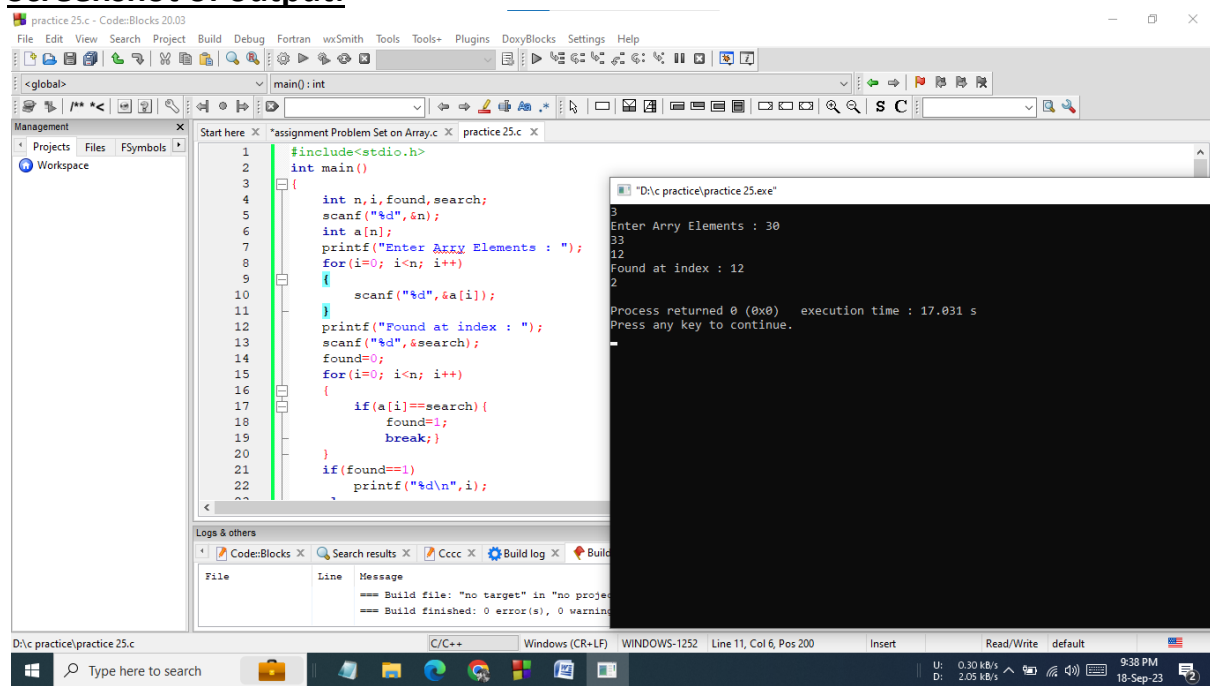
Screenshot of output:
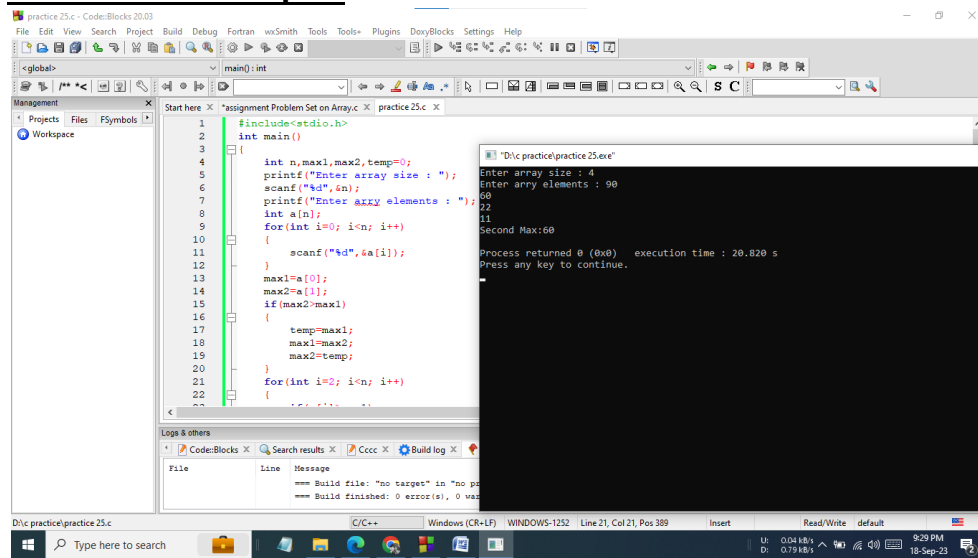
Hand Written Code:

Problem No: 15

Problem Name: Write a C program that would search for a particular number in an array.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,i,found,search;
    scanf("%d",&n);
    int a[n];
    printf("Enter Arry Elements : ");
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    printf("Found at index : ");
    scanf("%d",&search);
    found=0;
    for(i=0; i<n; i++)
    {
        if(a[i]==search){
            found=1;
            break;}
    }
    if(found==1)
        printf("%d\n",i);
    else
        printf("Not found\n");
    return 0;
}
```

## Screenshot of output:

Hand Written Code:

Problem No: 16

Problem Name: Write a program in C to separate odd and even integers in separate arrays.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,i;
    printf("Input array size : ");
    scanf("%d",&n);
    int a[n];
    printf("Input elements in the array :\n");
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    printf("The Even elements are :\n");
    for(int k=0; k<n; k++)
    {
        if(a[k]%2==0)
            printf("%d ",a[k]);
    }
    printf("\n");
    printf("The Odd elements are :\n");
    for(int j=0; j<n; j++)
    {
        if(a[j]%2==1)
            printf("%d ",a[j]);}
    printf("\n");
    return 0;
}
```

Screenshot of output:
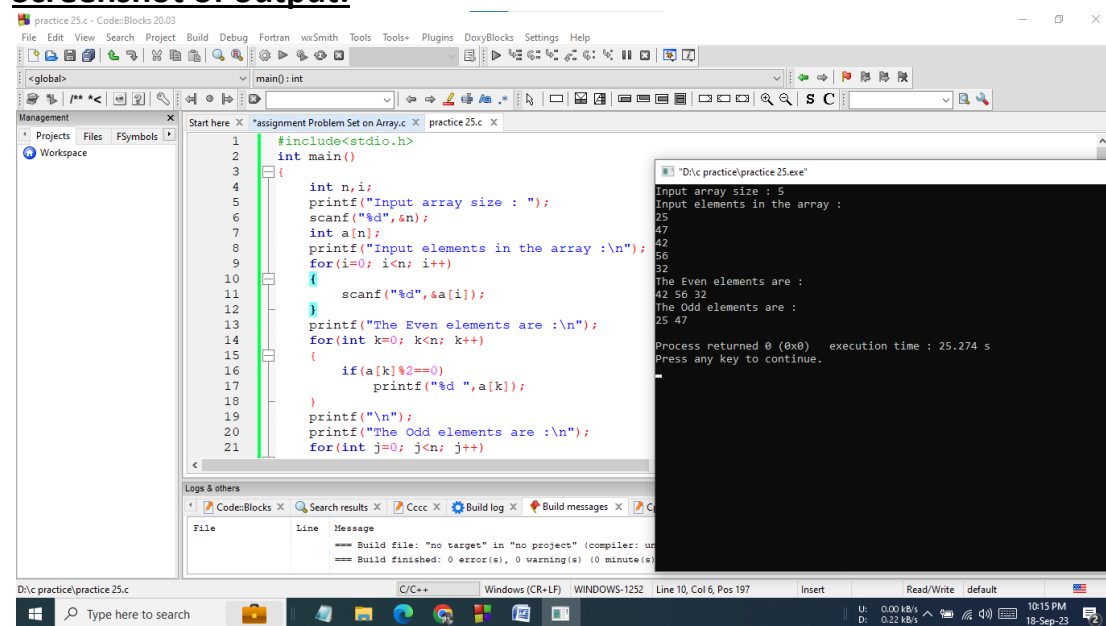
Hand Written Code:
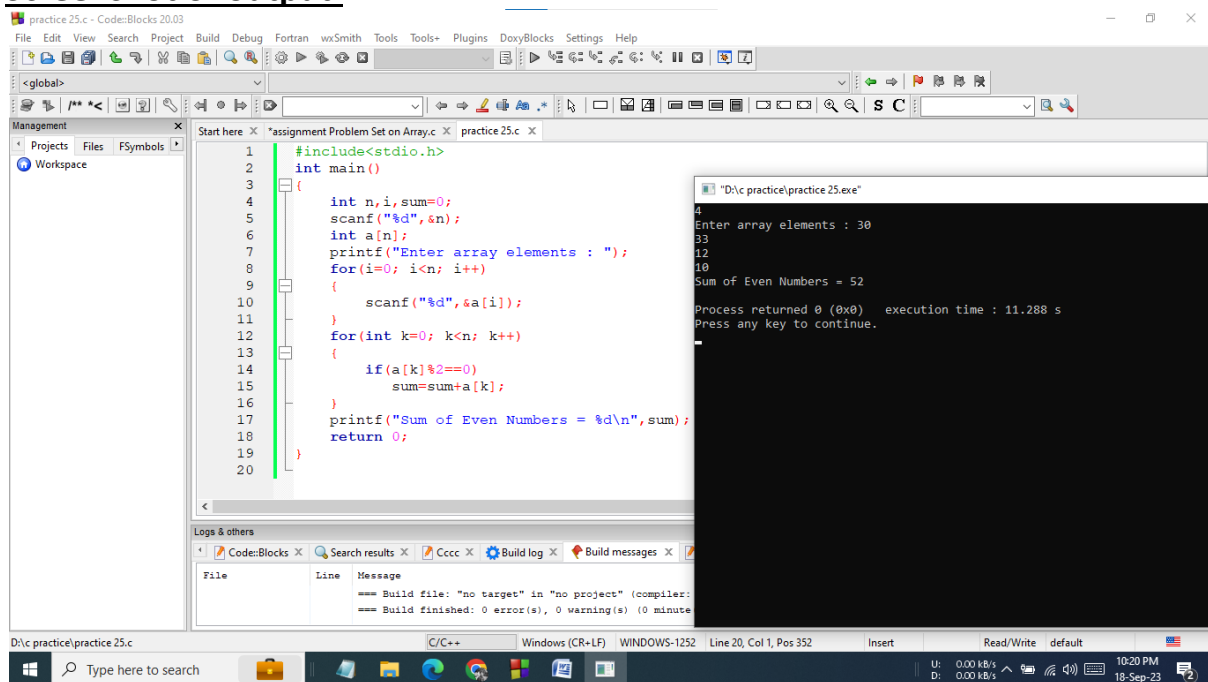
Problem No: 17

Problem Name: Write a C program that would only print the sum of all the even numbers in an array.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,i,sum=0;
    scanf("%d",&n);
    int a[n];
    printf("Enter array elements : ");
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    for(int k=0; k<n; k++)
    {
        if(a[k]%2==0)
            sum=sum+a[k];
    }
    printf("Sum of Even Numbers = %d\n",sum);
    return 0;
}
```
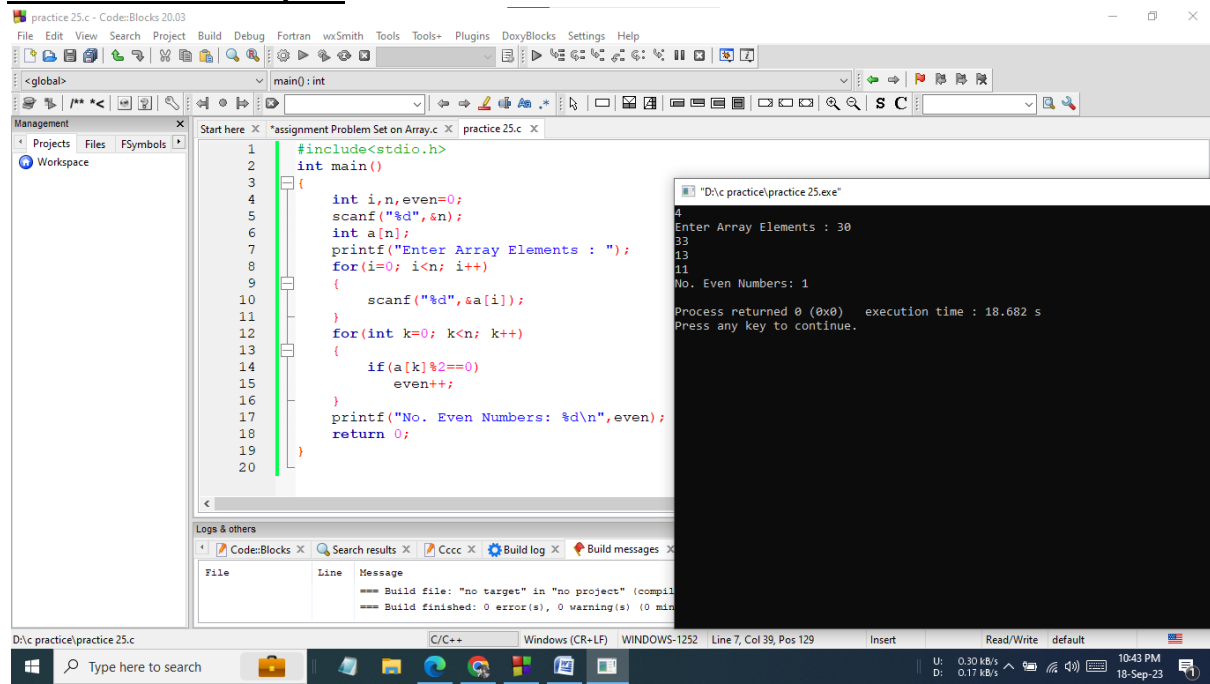
Screenshot of output:

Hand Written Code:

Problem No: 18

Problem Name: Write a C program that would count the even numbers in an array.

Source Code:

```c
#include<stdio.h>
int main()
{
    int i,n,even=0;
    scanf("%d",&n);
    int a[n];
    printf("Enter Array Elements : ");
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    for(int k=0; k<n; k++)
    {
        if(a[k]%2==0)
            even++;
    }
    printf("No. Even Numbers: %d\n",even);
    return 0;
}
```

Screenshot of output:

Hand Written Code:

Problem No: 19
Problem Name: Write a program in C to print the duplicate elements in an array.
Source Code:
```c
#include<stdio.h>
int main()
{
    int n,i,j,k;
    scanf("%d",&n);
    int a[n],b[n];
    printf("Enter array elements :\n");
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    printf("Duplicate :\n");
    for(i=0; i<n; i++)
    {
        for(j=i+1; j<n-1; j++)
        {
            if(a[i]==a[j])
                printf("%d\n",a[j]);
        }
    }
    return 0;
}
```
## Screenshot of output:

Hand Written Code:

Problem No: 20

Problem Name: Write a program in C to print the duplicate elements in an array.

Source Code:

```c
#include <stdio.h>
int main()
{
    int n,i,j,count;
    scanf("%d",&n);
    int arr[n],freq[100];
    printf("Enter arry elements:\n");
    for(i=0; i<5; i++){
        scanf("%d", &arr[i]);
        freq[i] = -100;
    }
    for(i=0; i<5; i++){
        count = 1;
        for(j=i+1; j<5; j++)
        {
            if(arr[i] == arr[j])
            {
                count++;
                freq[j] = 0;
            }
        }
        if(freq[i] != 0)
            freq[i] = count;
    }
    printf("\nUnique elements :\n");
    for(i=0; i<5; i++){
        if(freq[i]==1)
            printf("%d\n", arr[i]);}
    return 0;
}
```

## Screenshot of output:
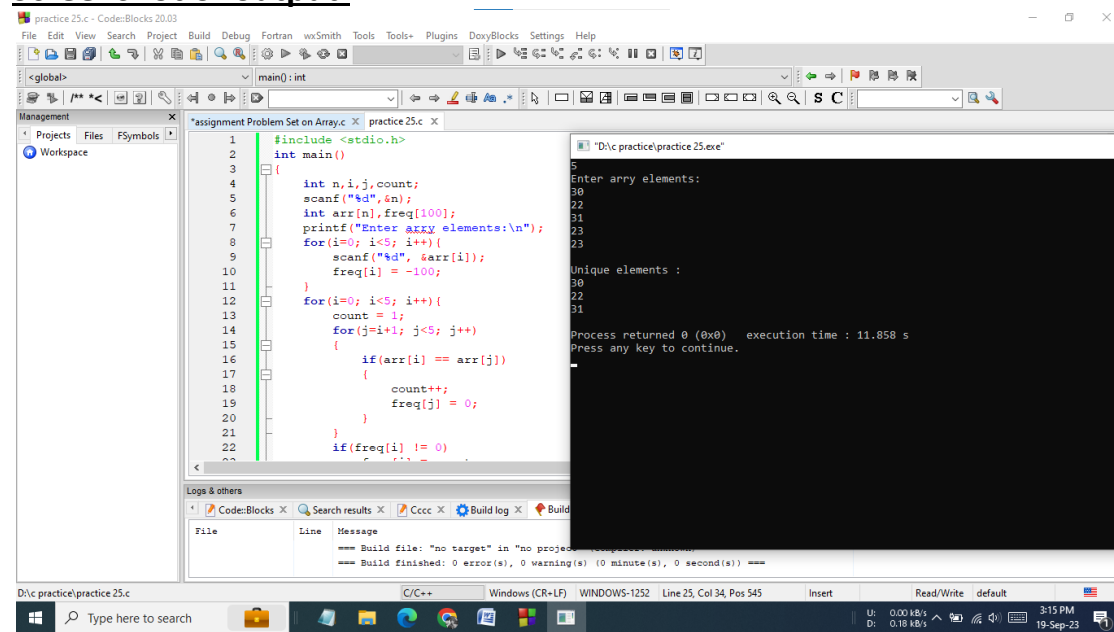
Hand Written Code:

Problem No: 21
Problem Name: Take a N size array and array element taken from user.Write a program in C to copy the elements of one array into another array.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,i;
    printf("Array size : ");
    scanf("%d",&n);
    int a[n],b[n];
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    for(i=0; i<n; i++)
    {
        b[i]=a[i];}
    printf("The elements stored in the first array are : ");
    for(i=0; i<n; i++)
    {
        printf("%d ",a[i]);}
    printf("\nThe elements copied into the second array are : ");
    for(i=0; i<n; i++)
    {
        printf("%d ",b[i]);}
    return 0;
}
```

Screenshot of output:
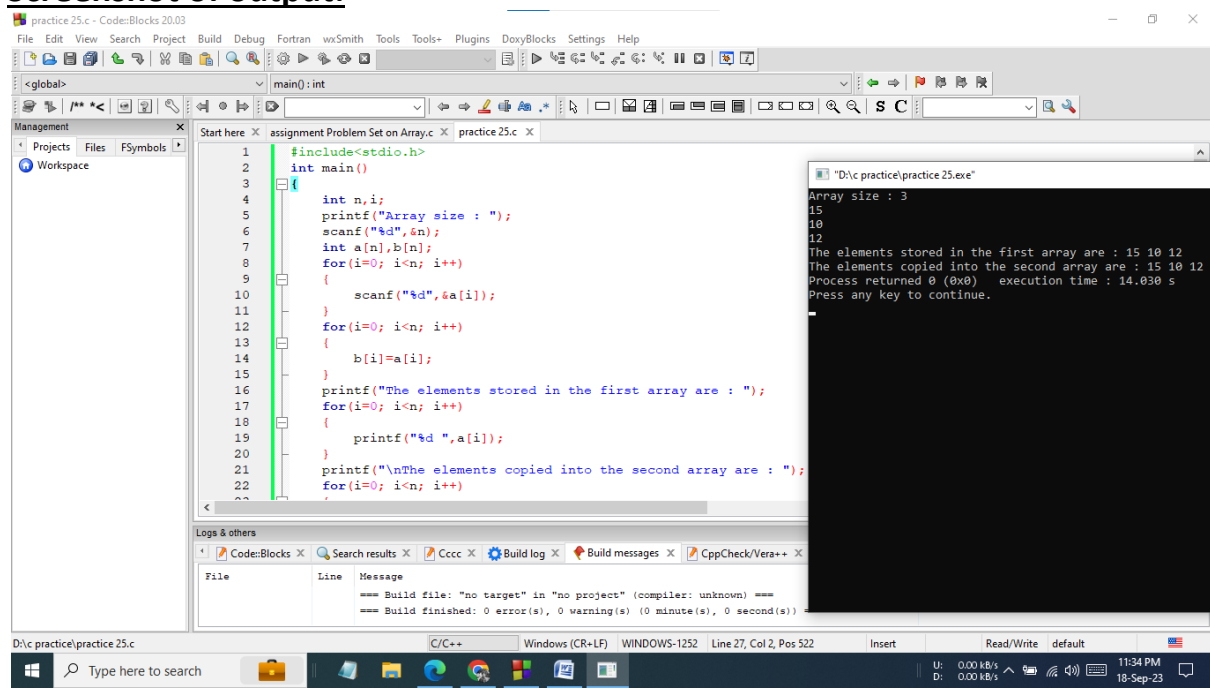
Hand Written Code:

Problem No: 22

Problem Name: Write a program in C to sort elements of an array in ascending order.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,i,j,temp;
    scanf("%d",&n);
    int a[n];
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    for(i=0; i<n; i++)
    {
        for(j=i+1; j<n; j++)
        {
            if(a[i]>a[j])
            {
                temp=a[i];
                a[i]=a[j];
                a[j]=temp;
            }
        }
    }
    for(i=0; i<n; i++)
        printf("%d ",a[i]);
    return 0;
}
```

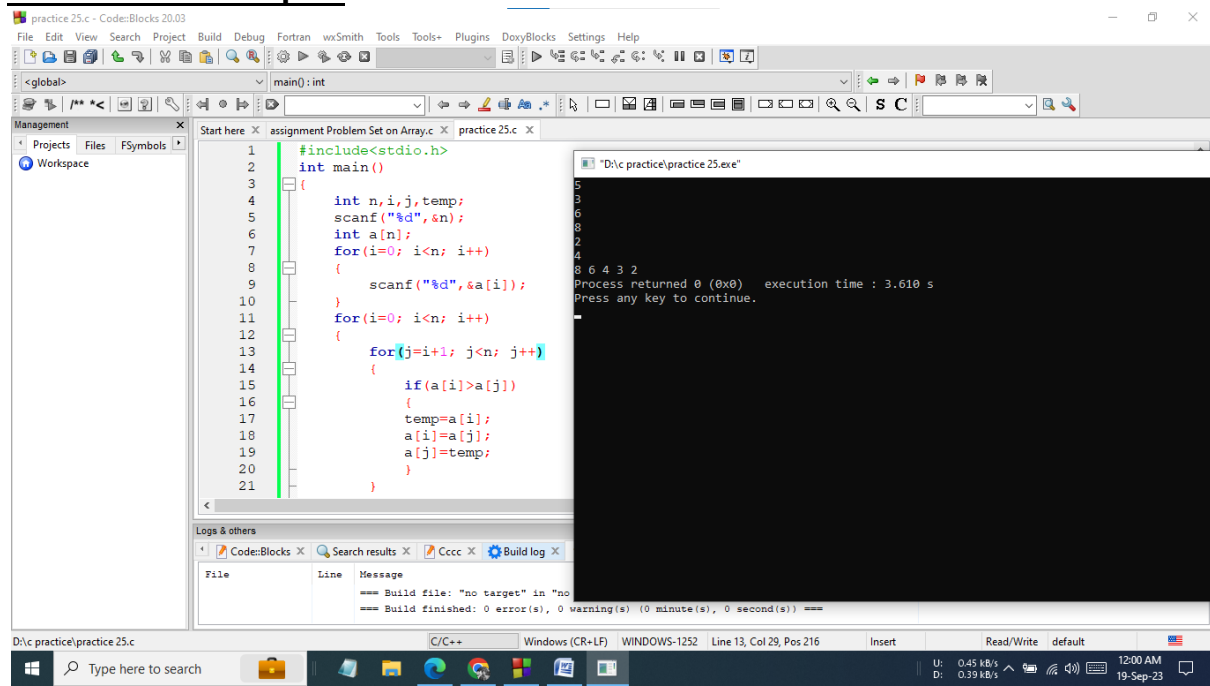## Screenshot of output:

Hand Written Code:

Problem No: 23

Problem Name: Write a program in C to sort the elements of the array in descending order.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n,i,j,temp;
    scanf("%d",&n);
    int a[n];
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);}
    for(i=0; i<n; i++)
    {
        for(j=i+1; j<n; j++)
        {
            if(a[i]>a[j])
            {
            temp=a[i];
            a[i]=a[j];
            a[j]=temp;
            }
        }
    }
    for(i=n-1; i>=0; i--)
        printf("%d ",a[i]);
    return 0;
}
```
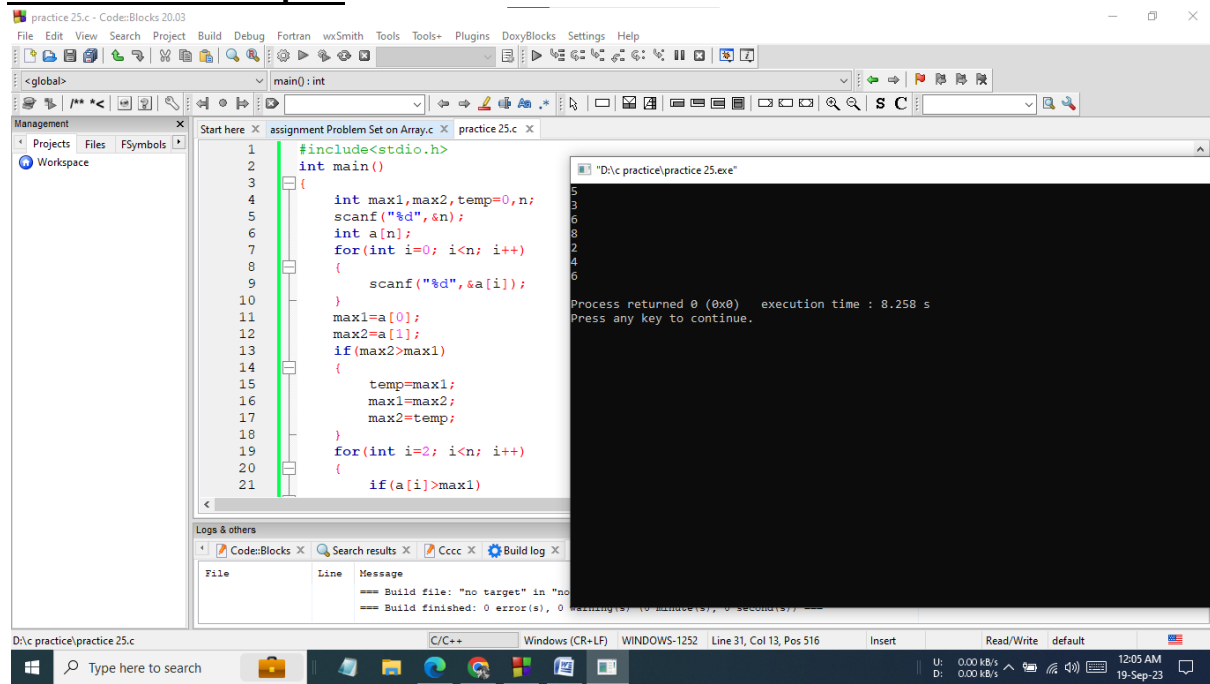
Screenshot of output:

Hand Written Code:

Problem No: 24

Problem Name: Write a program in C to find the second largest element in an array..

Source Code:

```c
#include<stdio.h>
int main()
{
    int max1,max2,temp=0,n;
    scanf("%d",&n);
    int a[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    max1=a[0];
    max2=a[1];
    if(max2>max1)
    {
        temp=max1;
        max1=max2;
        max2=temp;
    }
    for(int i=2; i<n; i++)
    {
        if(a[i]>max1)
        {
            max2=max1;
            max1=a[i];
        }
        else if(a[i]>=max2)
        {
            max2=a[i];
        }
    }
    printf("%d\n",max2);
    return 0;
}
```

Screenshot of output:

Hand Written Code:

Problem No: 25

Problem Name: Write a program in C to find the second smallest element in an array.

Source Code:

```c
#include<stdio.h>
int main()
{
    int min1,min2,temp=0,n;
    scanf("%d",&n);
    int a[n];
    for(int i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    min1=a[0];
    min2=a[1];
    if(min2<min1)
    {
        temp=min1;
        min1=min2;
        min2=temp;
    }
    for(int i=2; i<n; i++)
    {
        if(a[i]<min1)
        {
            min2=min1;
            min1=a[i];
        }
        else if(a[i]<=min2)
        {
            min2=a[i];
        }
    }
    printf("%d\n",min2);
    return 0;
}
```

Screenshot of output:

Hand Written Code:
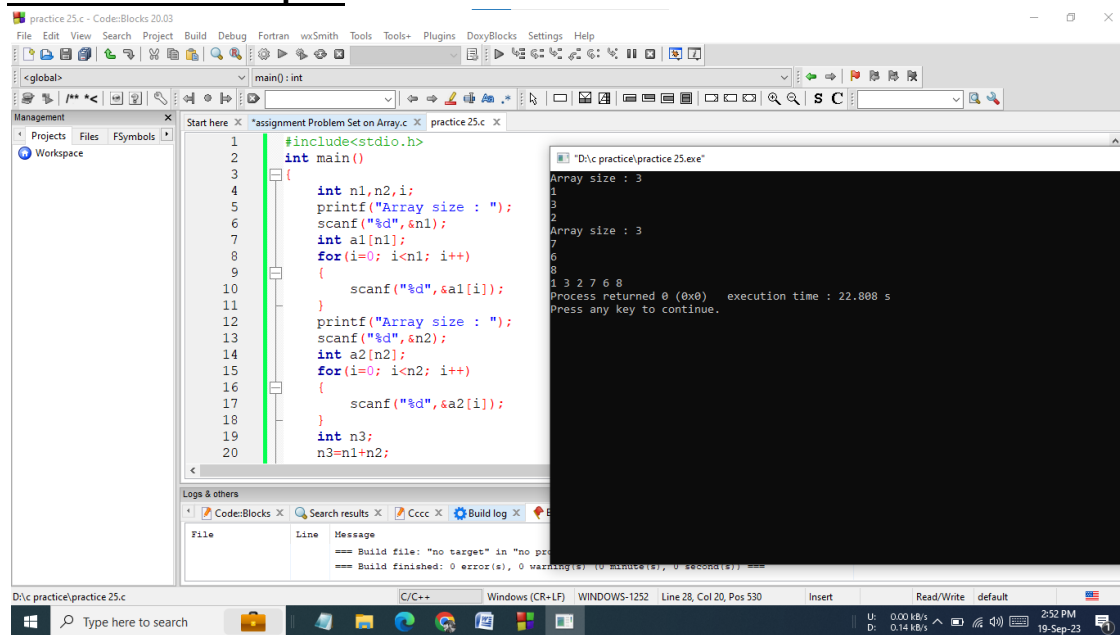
Problem No: 26

Problem Name: Write a program in C to merge two arrays of the same size.

Source Code:

```c
#include<stdio.h>
int main()
{
    int n1,n2,i;
    printf("Array size : ");
    scanf("%d",&n1);
    int a1[n1];
    for(i=0; i<n1; i++)
    {
        scanf("%d",&a1[i]);
    }
    printf("Array size : ");
    scanf("%d",&n2);
    int a2[n2];
    for(i=0; i<n2; i++)
    {
        scanf("%d",&a2[i]);}
    int n3;
    n3=n1+n2;
    int a3[100];
    int temp=0;
    for(i=0; i<n1; i++)
        a3[i]=a1[i];
    for(i=0; i<n2; i++)
        a3[i+n1]=a2[i];
    for(i=0; i<n3; i++)
        printf("%d ",a3[i]);
    return 0;
}
```

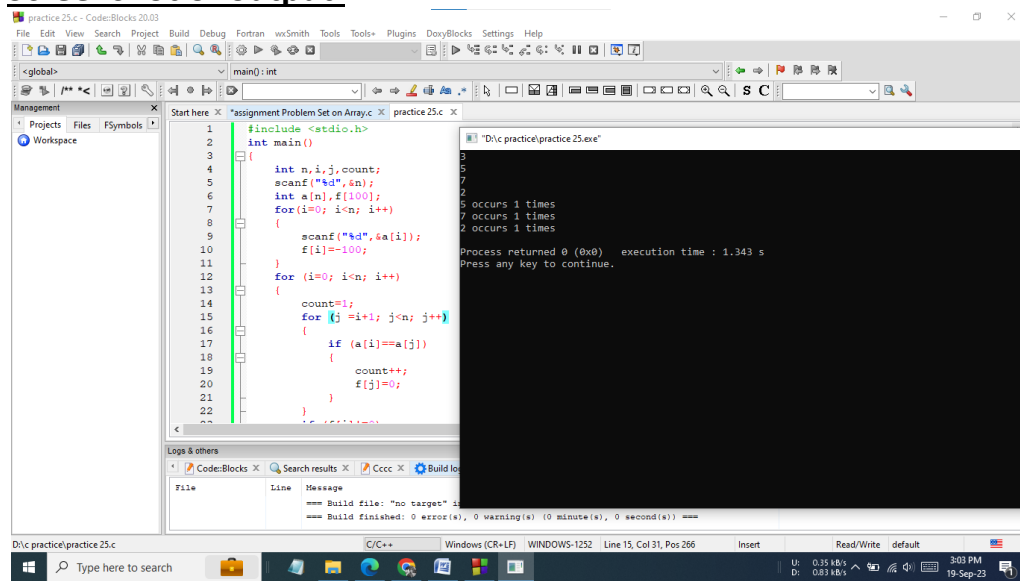## Screenshot of output:

Hand Written Code:

Problem No: 27

Problem Name: Write a program in C to count the frequency of each element of an array.

Source Code:

```c
#include <stdio.h>
int main()
{
    int n,i,j,count;
    scanf("%d",&n);
    int a[n],f[100];
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
        f[i]=-100;
    }
    for (i=0; i<n; i++)
    {
        count=1;
        for (j =i+1; j<n; j++)
        {
            if (a[i]==a[j])
            {
                count++;
                f[j]=0;
            }
        }
        if (f[i]!=0)
            f[i]=count;
    }
    for (i=0; i<n; i++)
    {
        if (f[i]!=0)
            printf("%d occurs %d times\n",a[i],f[i]);}
    return 0;
}
```

Screenshot of output:

Hand Written Code: