Indian Institute of Information Technology, Vadodara International Campus Diu

CS LAB –1

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Branch: Computer Science and Engineering

Batch: 2022

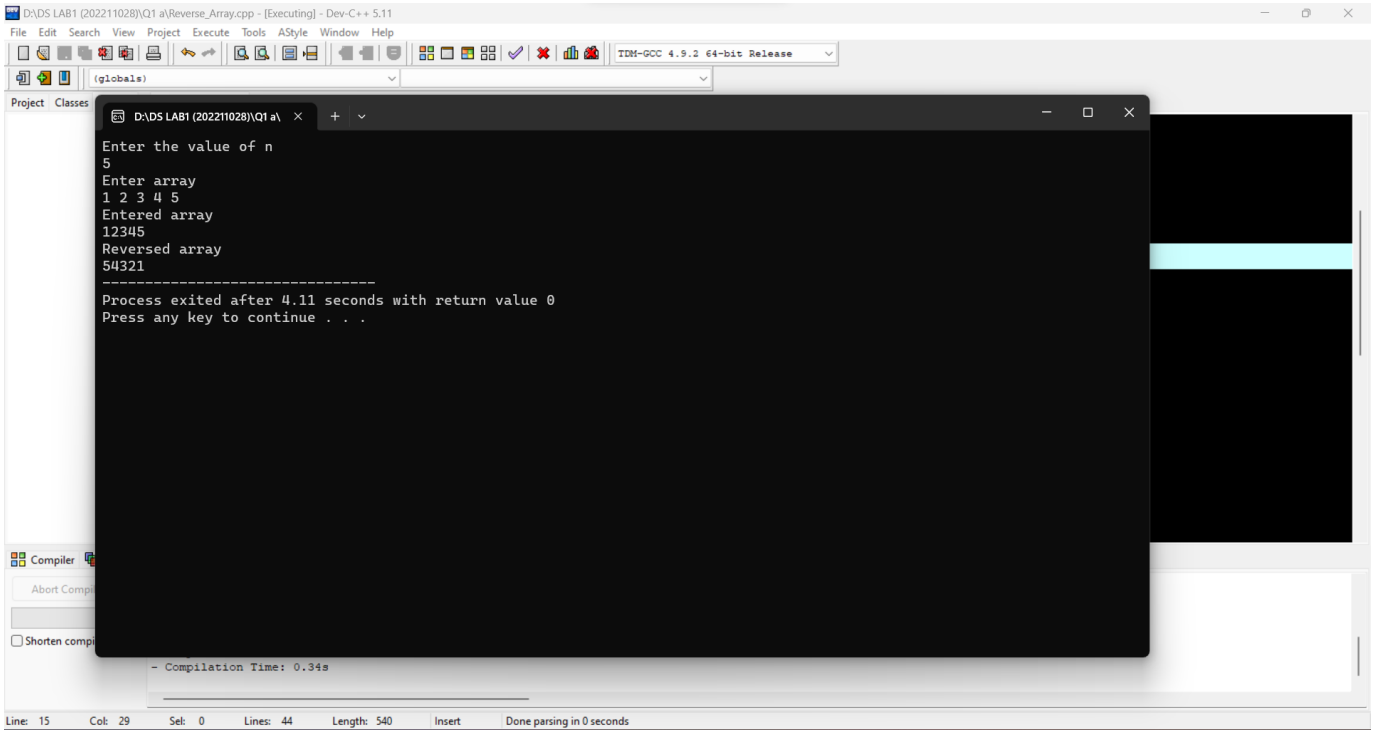
Subject: CS162

Session: 2022-23

Q1(a)

```c
#include<stdio.h>

int swap(int *a,int *b)
{
    int temp=*a;
    *a = *b;
    *b = temp;
}
int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);
    int a[n];
    printf("Enter array\n");
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }

    printf("Entered array\n");

        for(int i=0;i<n;i++)
    {
        printf("%d",a[i]);
    }
    printf("\n");

    printf("Reversed array\n");


        for(int i=0;i<=n/2;i++)
    {
          swap(&a[i],&a[n-i-1]);
    }



        for(int i=0;i<n;i++)
    {
        printf("%d",a[i]);
    }

}
```

Output:-

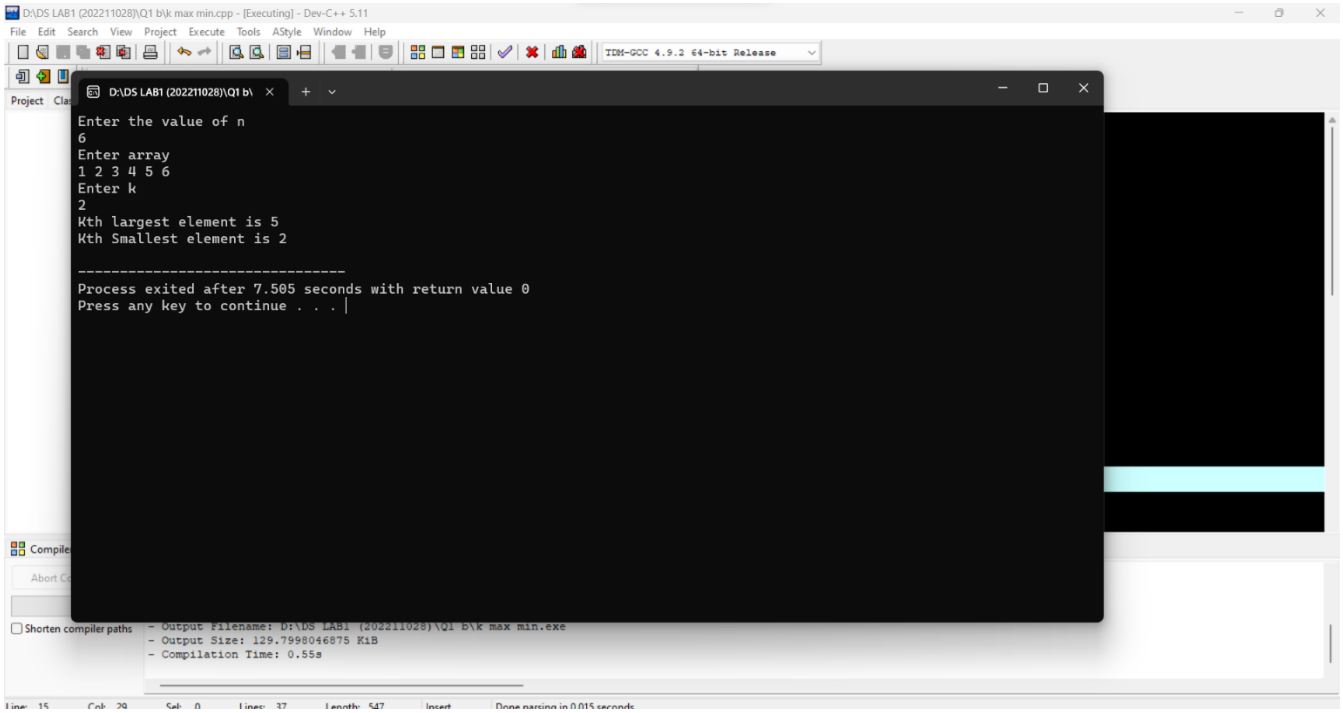

D:\DS LAB1 (202211028)\Q1 a\Reverse_Array.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes
D:\DS LAB1 (202211028)\Q1 a\
Enter the value of n
5
Enter array
1 2 3 4 5
Entered array
12345
Reversed array
54321

Process exited after 4.11 seconds with return value 0
Press any key to continue . . .
Compiler
- Compilation Time: 0.34s
Line: 15 Col: 29 Sel: 0 Lines: 44 Length: 540 Insert Done parsing in 0 seconds

Q1(b)

```c
#include<stdio.h>

int swap(int *a,int *b)
{
    int temp=*a;
    *a = *b;
    *b = temp;
}
int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);

    int a[n];
    printf("Enter array\n");
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }

    for(int i=0;i<n-1;++i)
    {
        for(int j=0;j<n-i-1;++j)
        {
            if(a[j]>a[j+1])
            swap(&a[j],&a[j+1]);

        }
    }
    printf("Enter k\n");
    int k;
    scanf("%d",&k);

    printf("Kth largest element is %d \n",a[n-k]);
    printf("Kth Smallest element is %d \n",a[k-1]);

}
```

Output:-


D:\DS LAB1 (202211028)\Q1 b\k max min.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
D:\DS LAB1 (202211028)\Q1 b\
Enter the value of n
6
Enter array
1 2 3 4 5 6
Enter k
2
Kth largest element is 5
Kth Smallest element is 2

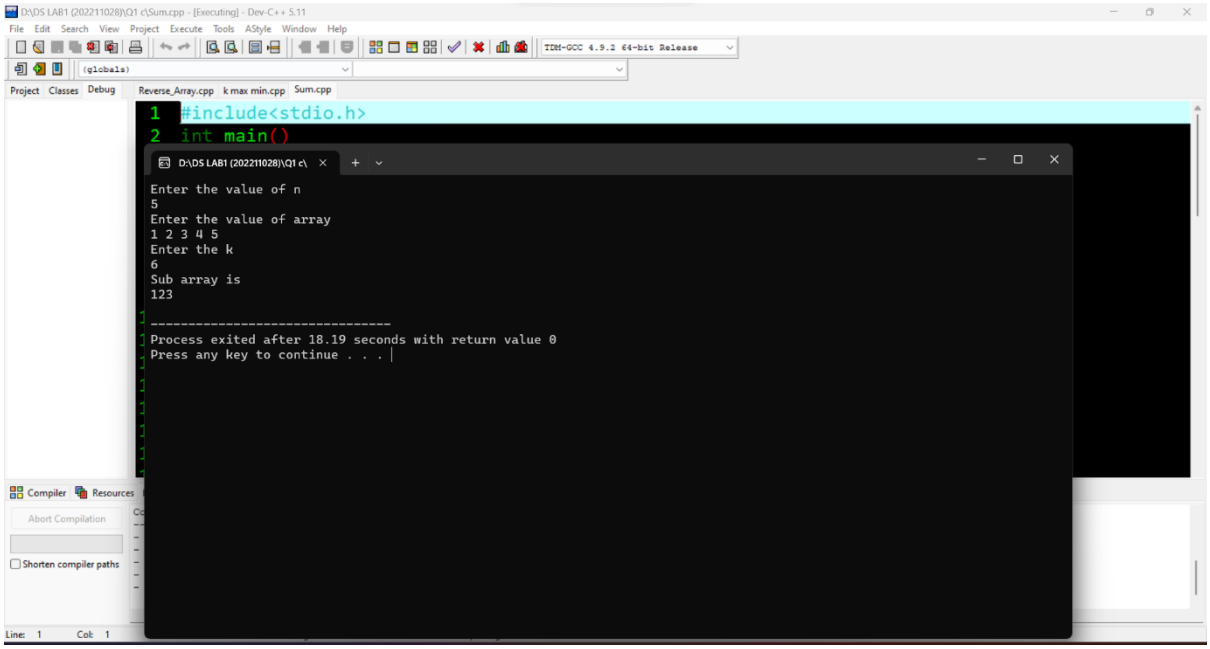
Process exited after 7.505 seconds with return value 0
Press any key to continue . . .
Shorten compiler paths
- Output Filename: D:\DS LAB1 (202211028)\Q1 b\k max min.exe
- Output Size: 129.7998046875 KiB
- Compilation Time: 0.55s

Q1(c)

```c
#include<stdio.h>
int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);

    int a[n];
    printf("Enter the value of array\n");
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }

    int k;
    printf("Enter the k\n");

    scanf("%d",&k);

    for(int i=0;i<n;i++)
    {
        int sum =a[i];
        if(sum == k)
        {

        printf("Sub array is %d\n",a[i]);

        break;

        }
        else
        {

        for(int j=i+1;j<n;j++)
        {
         sum  = sum +a[j];
          if(sum  == k)
          {
            printf("Sub array is \n");
            for(int k=i;k<=j;k++)
            {
                printf("%d",a[k]);
              }
              printf("\n");
              return 0;
          }
```

```
        }

        }
    }

    printf("No sub array found\n");
}
```

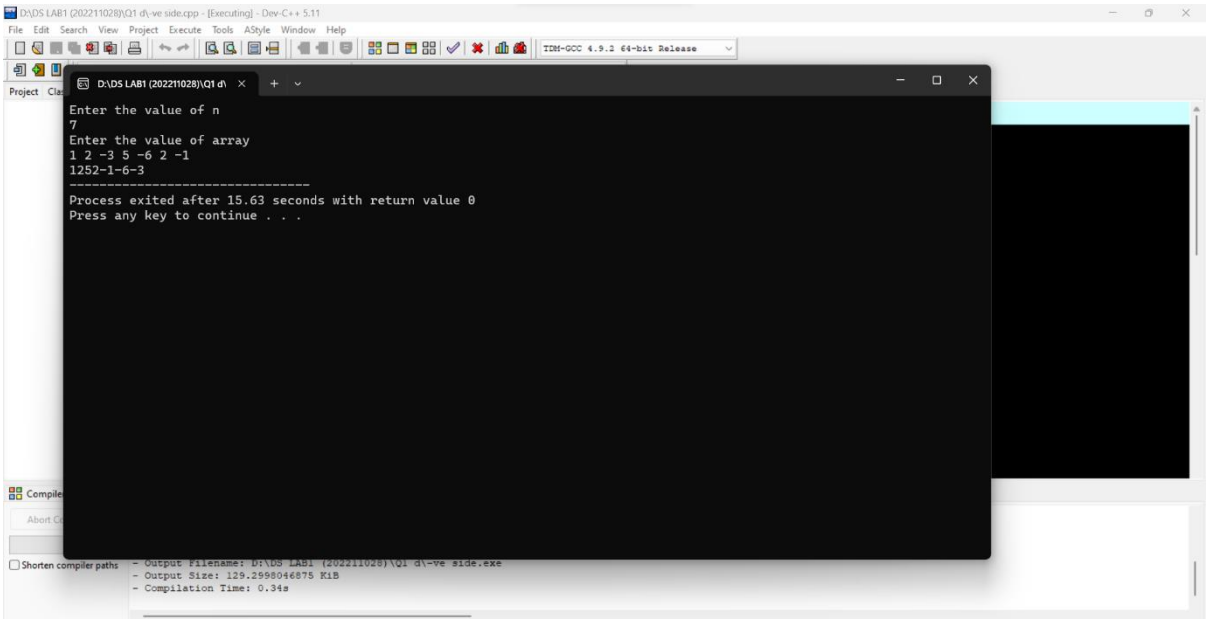
Output:-



Q1(d)

```c
#include<stdio.h>
int swap(int *a,int *b)
{
    int temp=*a;
    *a = *b;
    *b = temp;
}
int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);

    int a[n];
    printf("Enter the value of array\n");
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }
    int v=0;
    for(int i=0;i<n;i++)
    {
        if(a[i]<0)
        v++;
    }

    for(int i=0;i<n;i++)
    {
        for(int j=i+1;j<n;j++)
        {
            if(a[i]<0)
            swap(&a[i],&a[j]);
        }
    }
    for(int i=0;i<n;i++)
    {
        printf("%d",a[i]);
    }
return 0;
}
```

Output:-


D:\DS LAB1 (202211028)\Q1 d\-ve side.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
D:\DS LAB1 (202211028)\Q1 d\
Enter the value of n
7
Enter the value of array
1 2 -3 5 -6 2 -1
1252-1-6-3

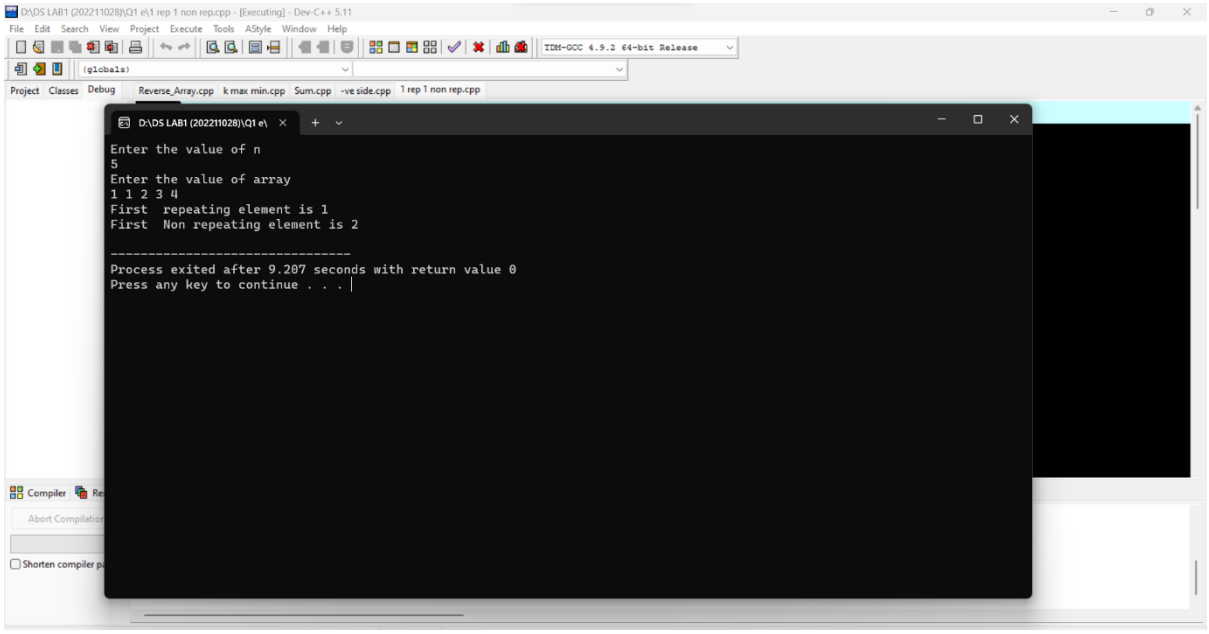
Process exited after 15.63 seconds with return value 0
Press any key to continue . . .
Shorten compiler paths
- Output Filename: D:\DS LAB1 (202211028)\Q1 d\-ve side.exe
- Output Size: 129.2998046875 KiB
- Compilation Time: 0.34s

Q1(e)

```c
#include<stdio.h>
int rep(int a[],int n)
{
    for(int i=0;i<n;i++)
    {
        for(int j=i+1;j<n;j++)
        {
            if(a[i]==a[j])
            {

            return a[i];
            }

        }

    }
    return -1;
}


int nonrep(int a[],int n)
{
    for(int i=0;i<n;i++)
    {
        for(int j=0;j<n;j++)
        {
            if(a[i]==a[j] && i!=j)
            break;

            if(j==n-1)
            return a[i];
        }
    }
    return-1;
}



int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);

    int a[n];
    printf("Enter the value of array\n");
    for(int i=0;i<n;i++)
```

```
    {
        scanf("%d",&a[i]);
    }

    int c = rep(a,n);
    printf("First  repeating element is %d\n",c);
    int d = nonrep(a,n);
    printf("First  Non repeating element is %d\n",d);
    return 0;
    }
```

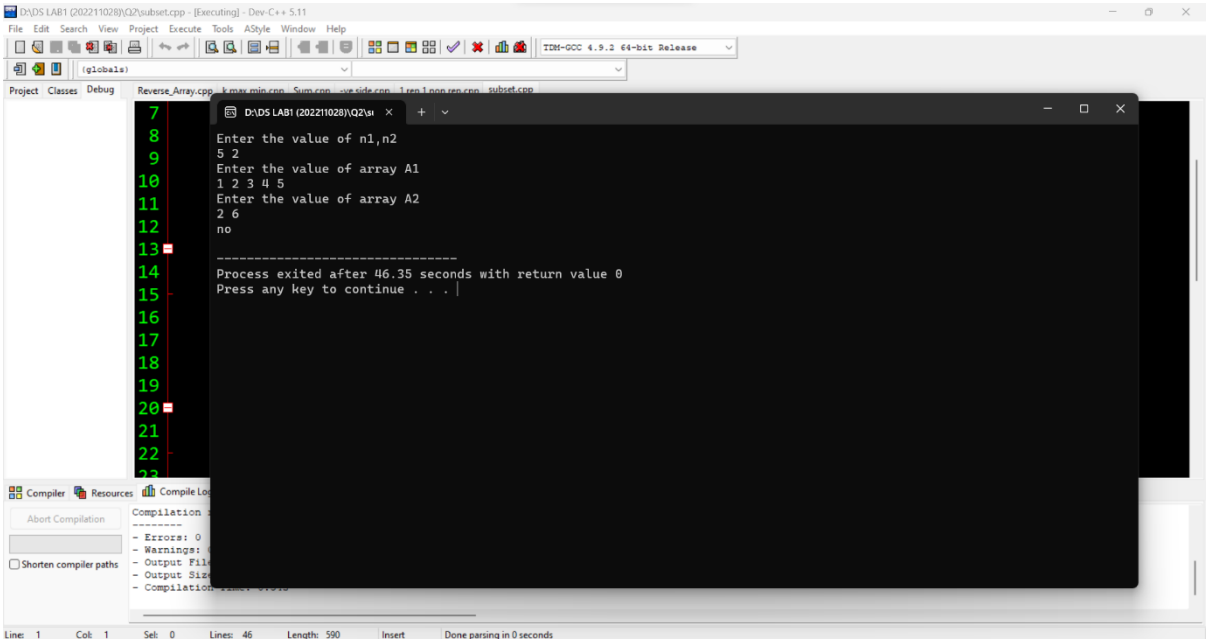
Output:-



Q2

```c
#include<stdio.h>
int main()
{

    int n1,n2;
    int v=0;
    printf("Enter the value of n1,n2 \n");
    scanf("%d %d",&n1,&n2);

    int a1[n1];
    printf("Enter the value of array A1\n");
    for(int i=0;i<n1;i++)
    {
        scanf("%d",&a1[i]);
    }

    int a2[n2];
    printf("Enter the value of array A2\n");
    for(int i=0;i<n2;i++)
    {
        scanf("%d",&a2[i]);
    }


    for(int i=0;i<n1;i++)
    {
        for(int j=0;j<n2;j++)
        {
            if(a1[i]!=a2[j])
            {
               v=0;
            }
            else{

             v=1;
        }

        }
    }
    if(v==0)
    printf("no\n");
    else
    printf("yes\n");
    return 0;
}
```

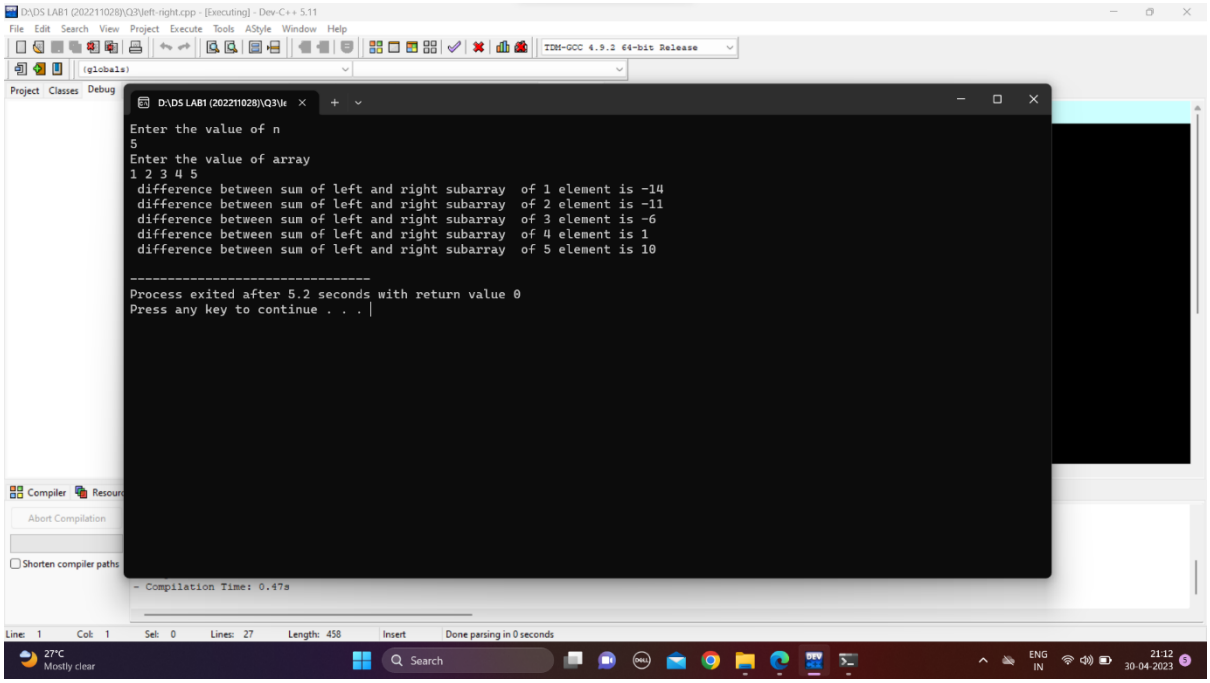
Output:-


Enter the value of n1,n2
5 2
Enter the value of array A1
1 2 3 4 5
Enter the value of array A2
2 6
no
Process exited after 46.35 seconds with return value 0
Press any key to continue . . .

Q3

```c
#include<stdio.h>
int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);

    int a[n];
    printf("Enter the value of array\n");
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }
    int sum=0;
    for(int i=0;i<n;i++)
    {
        sum=sum+a[i];
    }
    int v=0;
    for(int i=0;i<n;i++)
    {
        v=v+a[i];

        printf(" difference between sum of left and right subarray  of %d element is %d\n",i+1,(sum-(2*v)+a[i])*-1);
    }
    return 0;
}
```

Output:-

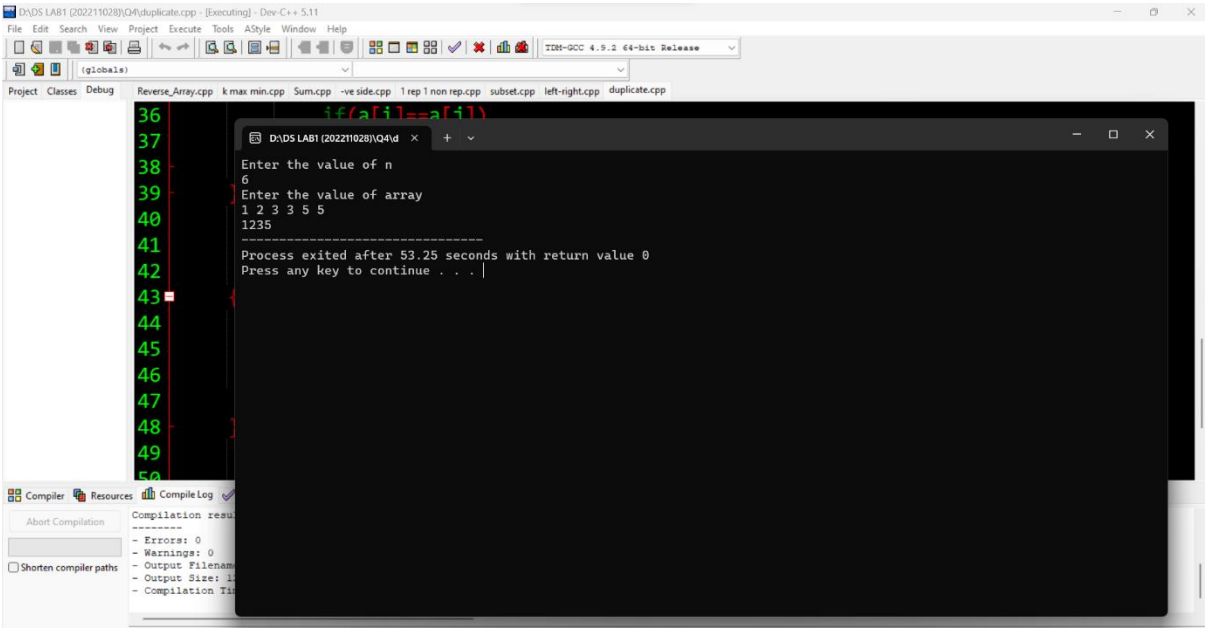

Enter the value of n
5
Enter the value of array
1 2 3 4 5
difference between sum of left and right subarray of 1 element is -14
difference between sum of left and right subarray of 2 element is -11
difference between sum of left and right subarray of 3 element is -6
difference between sum of left and right subarray of 4 element is 1
difference between sum of left and right subarray of 5 element is 10
Process exited after 5.2 seconds with return value 0
Press any key to continue . . .
- Compilation Time: 0.47s

Q4

```c
#include<stdio.h>
int swap(int *a,int *b)
{
    int temp=*a;
    *a = *b;
    *b = temp;
}
int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);

    int a[n];
    printf("Enter the value of array\n");
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }

 //bubble sort
    for(int i=0;i<n-1;++i)
    {
        for(int j=0;j<n-i-1;++j)
        {
            if(a[j]>a[j+1])
            swap(&a[j],&a[j+1]);

        }
    }

    for(int i=0;i<n;i++)
    {
        for(int j=i+1;j<n;j++)
        {
            if(a[i]==a[j])
            a[j]=0;
        }
    }
        int b[n];
        int k=0;
        for(int i=0;i<n;i++)
    {
             if(a[i]!=0)

             b[k++]=a[i];
```

```
    }

        for(int i=0;i<k;i++)
    {
        printf("%d",b[i]);
    }
    return 0;
}
```

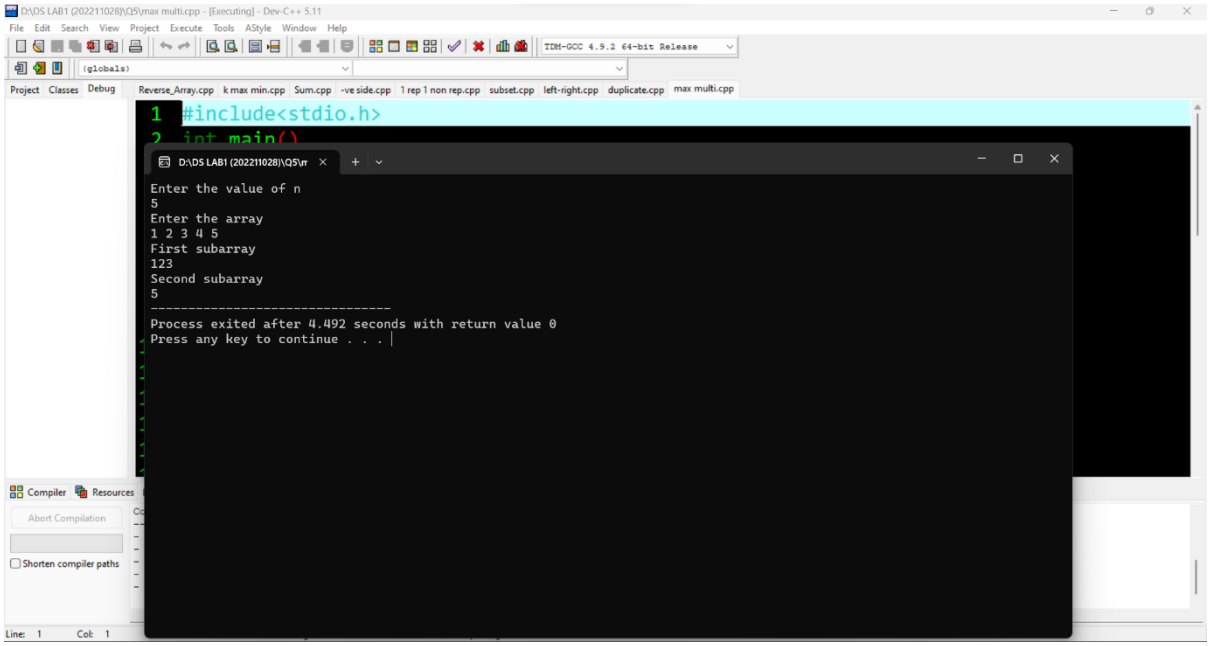
Output:-



Q5

```c
#include<stdio.h>
int main()
{
    int n;
    printf("Enter the value of n\n");
    scanf("%d",&n);
    printf("Enter the array\n");
    int a[n];
    for(int i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }
    int max=-1;
    int v=0;
     for (int i = 1; i < n; i++) {
        int leftSum = 0;
        for (int j = i - 1; j >= 0; j--) {
            leftSum += a[j];
        }

        int rightSum = 0;
        for (int k = i + 1; k < n; k++) {
            rightSum += a[k];
        }

        if(((leftSum) * (rightSum ))>max)
        {
        max=leftSum*rightSum;
        v=i;
        }
    }
    printf("First subarray\n");
    for(int i=0;i<v;i++)
    printf("%d",a[i]);
    printf("\n");
    printf("Second subarray\n");
    for(int i=v+1;i<n;i++)
    printf("%d",a[i]);
   return 0;
}
```

Output:-

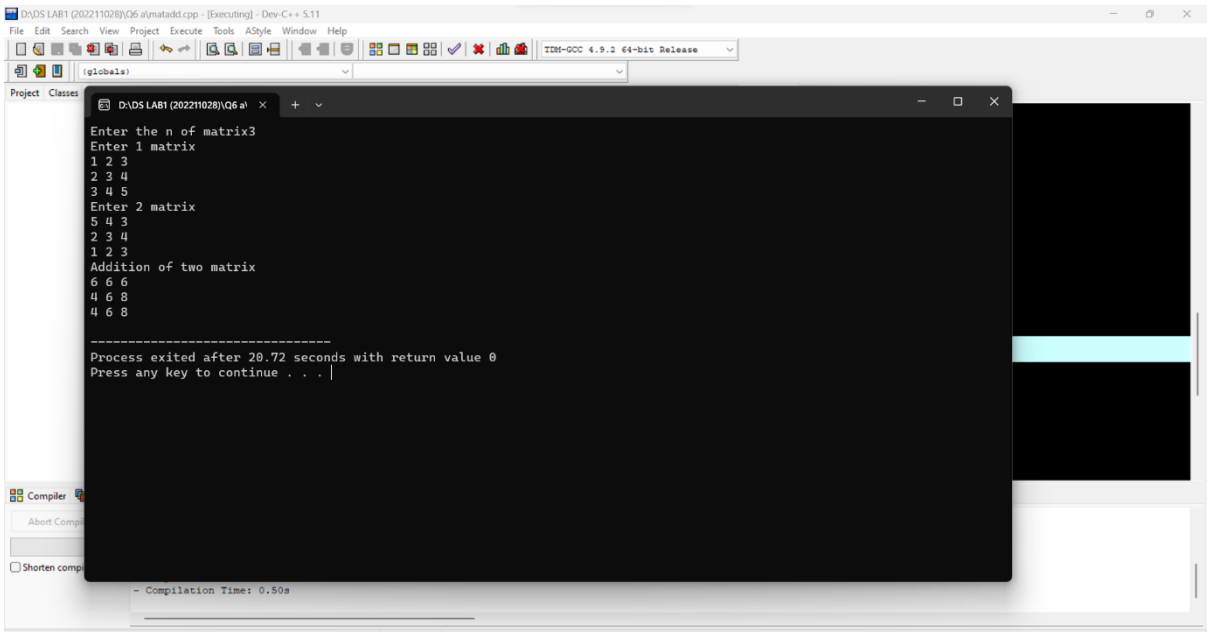

#include<stdio.h>
int main()
D:\DS LAB1 (202211028)\Q5\m
Enter the value of n
5
Enter the array
1 2 3 4 5
First subarray
123
Second subarray
5
Process exited after 4.492 seconds with return value 0
Press any key to continue . . .

Q6(a)

```c
#include<stdio.h>
int main()
{
  int n;
  printf("Enter the n of matrix");
  scanf("%d",&n);

  int a[n][n];
  int b[n][n];
  int c[n][n];

int i,j;
 printf("Enter 1 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&a[i][j]);
    }
 }


 printf("Enter 2 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&b[i][j]);
    }
 }

 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {


      c[i][j]=a[i][j]+b[i][j];


    }
    }
 printf("Addition of two matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
```

```
      printf("%d ",c[i][j]);
    }
    printf("\n");
 }


return 0;




}
```

Output:-

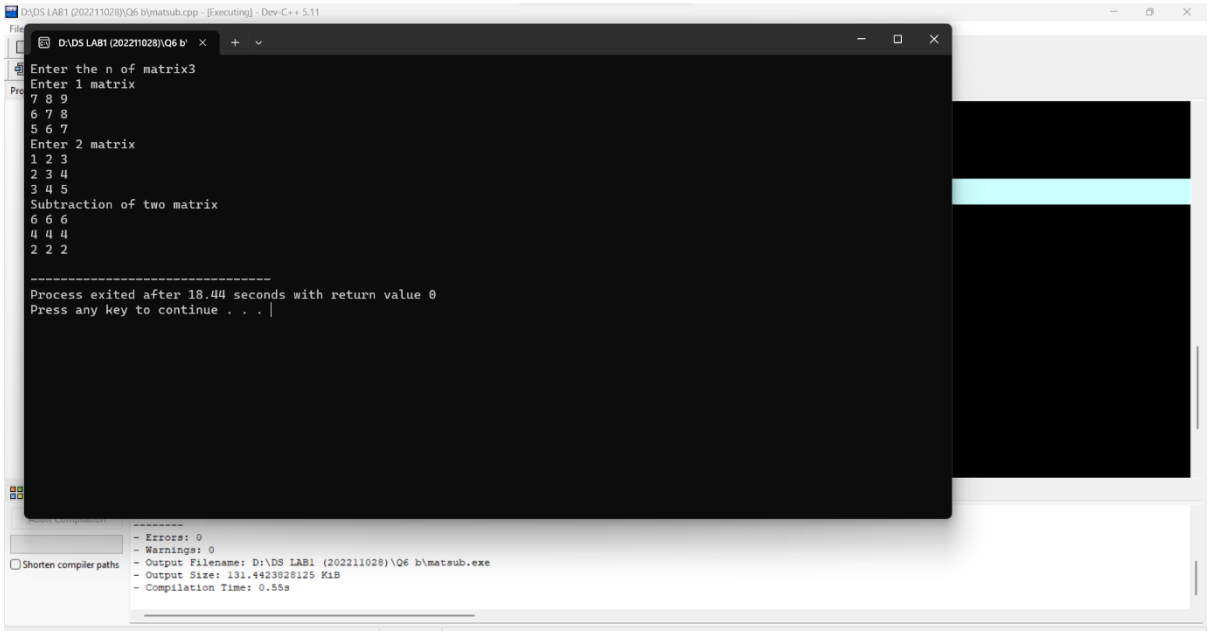


Q6(b)

```c
#include<stdio.h>
int main()
{
  int n;
  printf("Enter the n of matrix");
  scanf("%d",&n);

  int a[n][n];
  int b[n][n];
  int c[n][n];

int i,j;
 printf("Enter 1 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&a[i][j]);
    }
 }


 printf("Enter 2 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&b[i][j]);
    }
 }

 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {


      c[i][j]=a[i][j]-b[i][j];


    }
    }
  printf("Subtraction of two matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
```

```
      printf("%d ",c[i][j]);
    }
    printf("\n");
 }


return 0;




}
```

Output:-

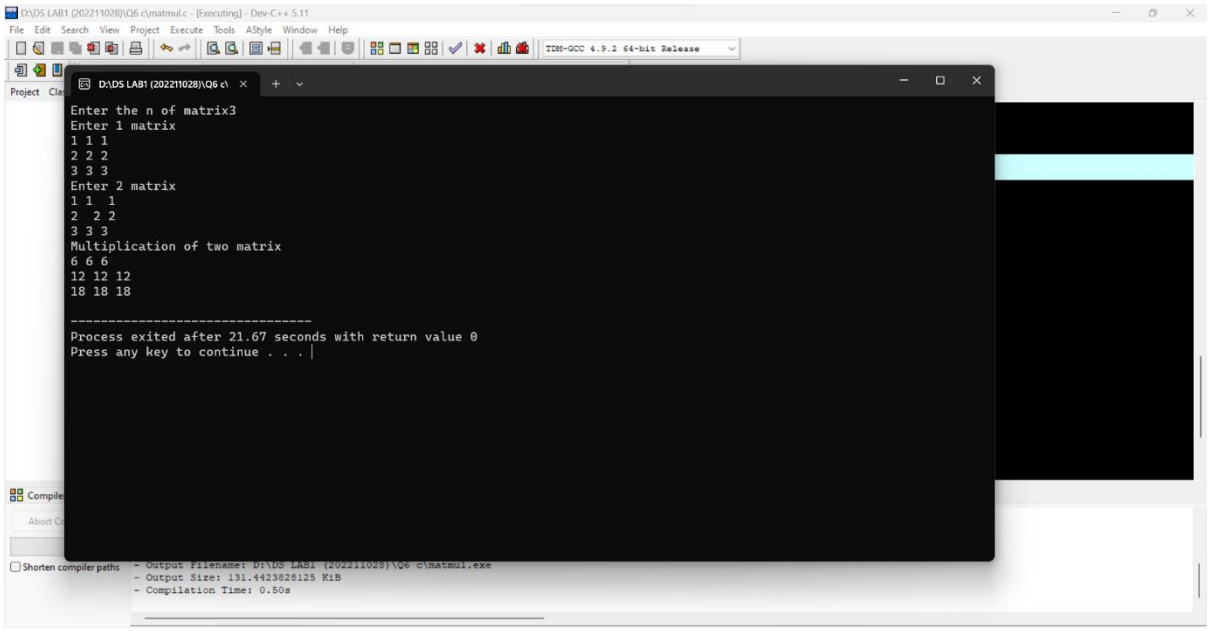


Q6(c)

```c
#include<stdio.h>
int main()
{
  int n;
  printf("Enter the n of matrix");
  scanf("%d",&n);

  int a[n][n];
  int b[n][n];
  int c[n][n];

  int i,j,k;
 printf("Enter 1 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&a[i][j]);
    }
 }


 printf("Enter 2 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&b[i][j]);
    }
 }

 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      c[i][j]=0;
      for(k=0;k<n;k++)
      {
      c[i][j]+=a[i][k]*b[k][j];
      }

    }
    }
 printf("Multiplication of two matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
```

```
    {
      printf("%d ",c[i][j]);
    }
    printf("\n");
 }


return 0;




}
```

Output:-

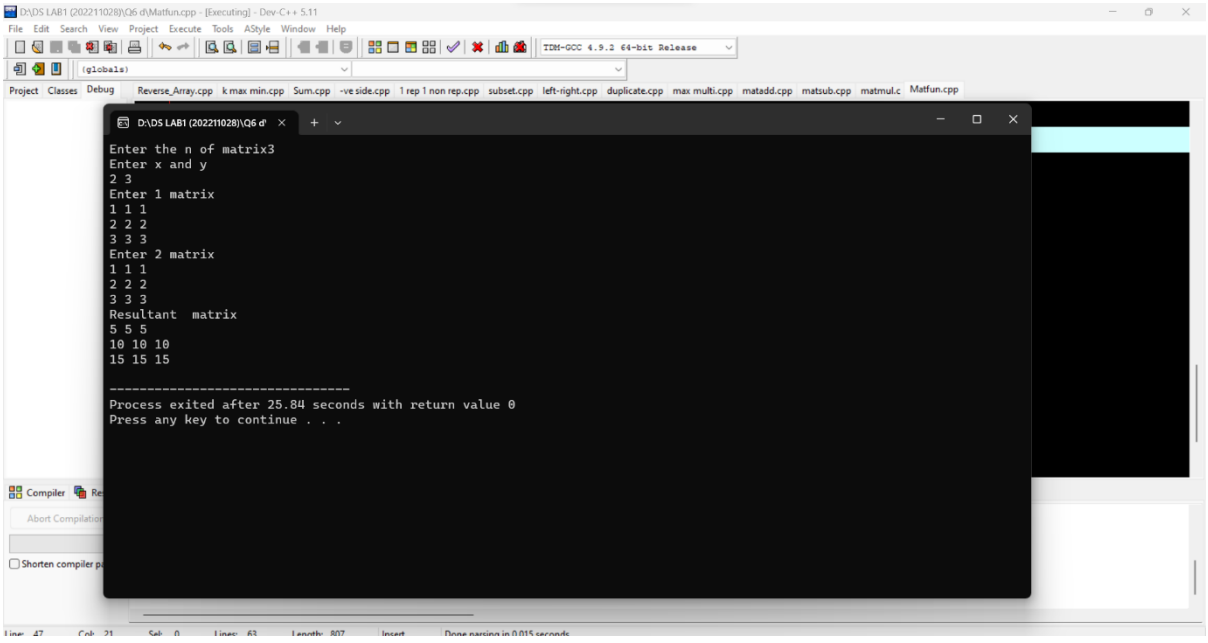


Q6(d)

```c
#include<stdio.h>
int main()
{
  int n;
  printf("Enter the n of matrix");
  scanf("%d",&n);

  int x,y;
  printf("Enter x and y\n");
  scanf("%d %d",&x,&y);

  int a[n][n];
  int b[n][n];
  int c[n][n];

int i,j;
 printf("Enter 1 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&a[i][j]);
    }
 }


 printf("Enter 2 matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&b[i][j]);
    }
 }

 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {


      c[i][j]= (x*a[i][j])+(y*b[i][j]);


    }
    }
  printf("Resultant  matrix\n");
```

```
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      printf("%d ",c[i][j]);
    }
    printf("\n");
 }


return 0;




}
```

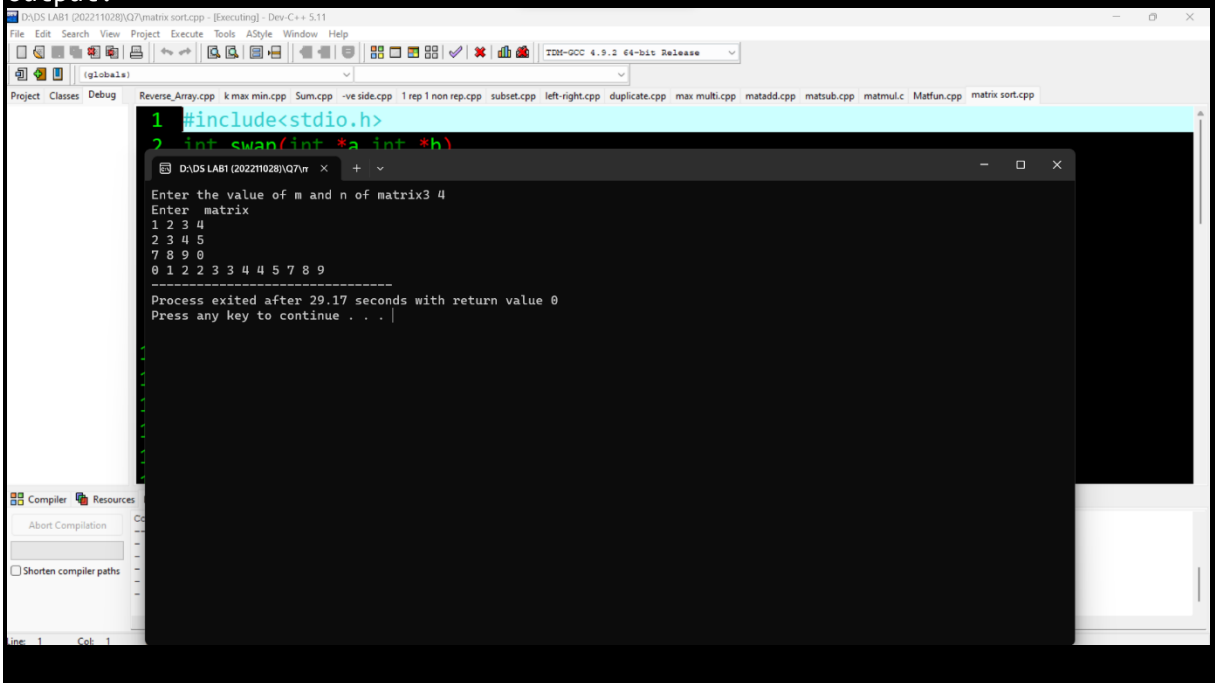
Output:-



Q7

```c
#include<stdio.h>
int swap(int *a,int *b)
{
  int temp=*a;
  *a = *b;
  *b = temp;
}
int main()
{
  int m,n;
  printf("Enter the value of m and n of matrix");
  scanf("%d %d",&m,&n);
  int a[m][n];

 printf("Enter  matrix\n");
 for(int i=0;i<m;i++)
 {
    for(int j=0;j<n;j++)
    {
      scanf("%d",&a[i][j]);
    }
 }
 int b[m*n];

  for(int i=0;i<m;i++)
 {
    for(int j=0;j<n;j++)
    {
         b[(n*i)+j] = a[i][j];
    }
 }
 for(int i=0;i<m*n-1;++i)
  {
    for(int j=0;j<m*n-i-1;++j)
    {
      if(b[j]>b[j+1])
      swap(&b[j],&b[j+1]);

    }
  }

  for(int i=0;i<m*n;i++)
 {
      printf("%d ",b[i]);
 }
 return 0;
}
```

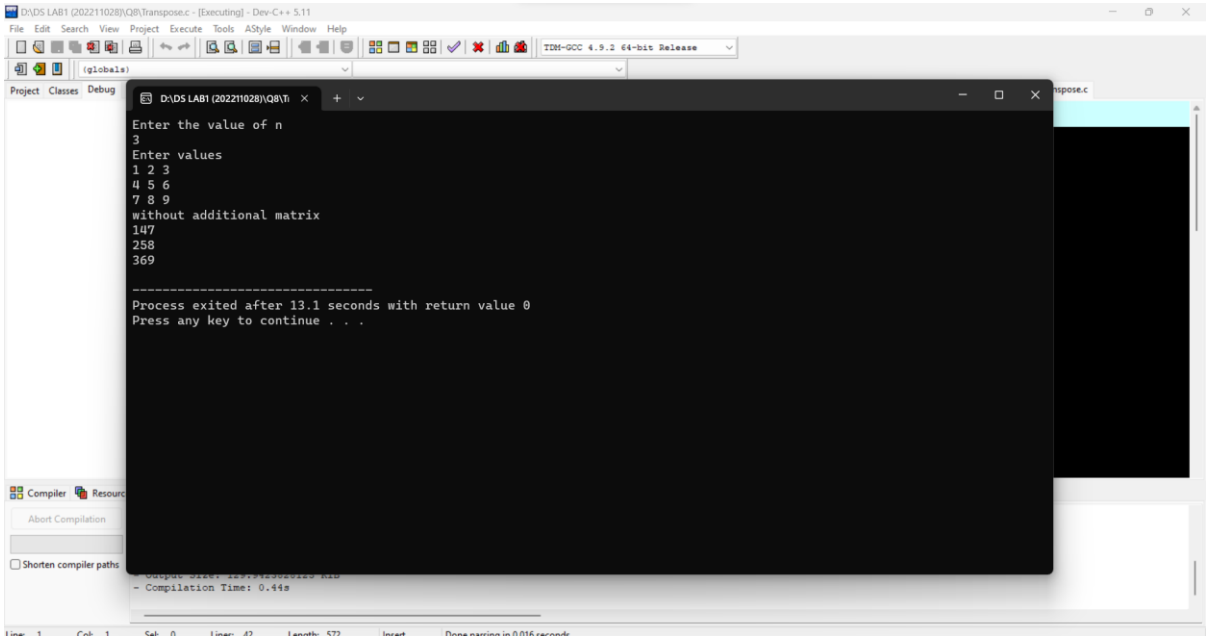
Output:-


#include<stdio.h>
int swap(int *a,int *b)
D:\DS LAB1 (202211028)\Q7\m
Enter the value of m and n of matrix3 4
Enter matrix
1 2 3 4
2 3 4 5
7 8 9 0
0 1 2 2 3 3 4 4 5 7 8 9
Process exited after 29.17 seconds with return value 0
Press any key to continue . . .

Q8

```c
#include<stdio.h>
int main()
{
int n;
 printf("Enter the value of n\n");
 scanf("%d",&n);

 int a[n][n];
 int i,j;
 printf("Enter values\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      scanf("%d",&a[i][j]);
    }
 }
 printf("without additional matrix\n");
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      if(j>i)
      {
           int temp;
           temp=a[i][j];
           a[i][j]=a[j][i];
           a[j][i]=temp;
      }
    }
 }
 for(i=0;i<n;i++)
 {
    for(j=0;j<n;j++)
    {
      printf("%d",a[i][j]);
    }
    printf("\n");
 }

 return 0;
}
```

Output:-


Enter the value of n
3
Enter values
1 2 3
4 5 6
7 8 9
without additional matrix
147
258
369

Process exited after 13.1 seconds with return value 0
Press any key to continue . . .

*_*_*_*_*