

## 1D ARRAYS

Q. Create an array of length 10 of integers. Values ranging from 1 to 50.

1. Find all pair of elements whose sum is 25.

### SOLUTION:

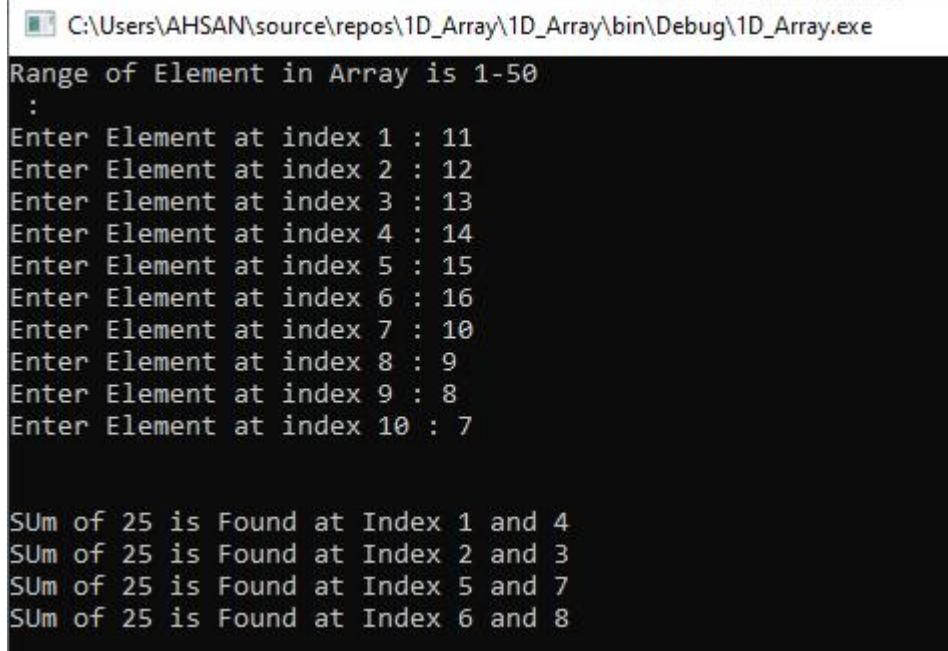
```
int[] arr = new int [10];

    Console.WriteLine("Range of Element in Array is 1-50\n :");
    for (int i = 0; i < arr.Length; i++)
    {
        Console.Write("Enter Element at index {0} : ",i+1);
        arr[i] = int.Parse(Console.ReadLine());
    }
    Console.WriteLine("\n");
    int count = 0;
    for (int j = 0; j < arr.Length; j++)
    {
        for (int k = (j+1); k < arr.Length-1; k++)
        {
            if ((arr[j]+arr[k])==25)
            {
                Console.WriteLine("SUM of 25 is Found at Index {0} and {1}
",j+1,k+1);

                count++;
            }
        }
    }
    if (count==0)
    {
        Console.WriteLine("no elements found whose sum is 25");
    }
```

```
Console.ReadLine();
```

## OUTPUT:



```
C:\Users\AHSAN\source\repos\1D_Array\1D_Array\bin\Debug\1D_Array.exe
Range of Element in Array is 1-50
:
Enter Element at index 1 : 11
Enter Element at index 2 : 12
Enter Element at index 3 : 13
Enter Element at index 4 : 14
Enter Element at index 5 : 15
Enter Element at index 6 : 16
Enter Element at index 7 : 10
Enter Element at index 8 : 9
Enter Element at index 9 : 8
Enter Element at index 10 : 7

SUM of 25 is Found at Index 1 and 4
SUM of 25 is Found at Index 2 and 3
SUM of 25 is Found at Index 5 and 7
SUM of 25 is Found at Index 6 and 8
```

2. Find the number of elements of A which are even, and the number of elements of A which are odd.

## SOLUTION:

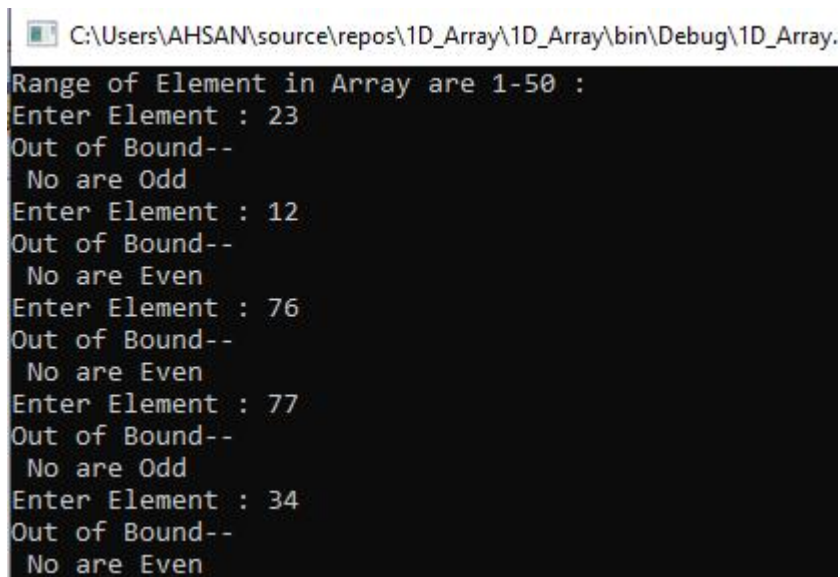
```
int[] arr = new int [5];

Console.WriteLine("Range of Element in Array are 1-50 :");

for (int i = 0; i < arr.Length; i++)
{
    Console.Write("Enter Element : ");
    int a = int.Parse(Console.ReadLine());
    if (arr[i]<1||arr[i]>50)
    {
        Console.WriteLine("Out of Bound--");
    }
    if (a % 2 == 0)
```

```
    {  
        Console.WriteLine(" No are Even");  
    }  
    else  
    {  
        Console.WriteLine(" No are Odd");  
    }  
}Console.ReadLine();
```

## OUTPUT:



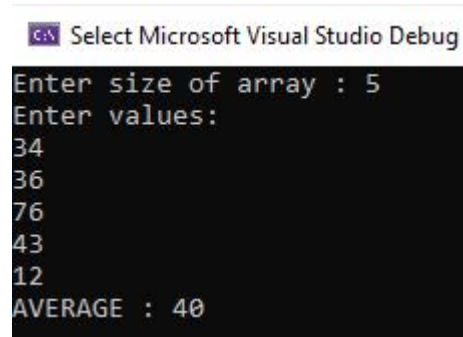
```
C:\Users\AHSAN\source\repos\1D_Array\1D_Array\bin\Debug\1D_Array.  
Range of Element in Array are 1-50 :  
Enter Element : 23  
Out of Bound--  
No are Odd  
Enter Element : 12  
Out of Bound--  
No are Even  
Enter Element : 76  
Out of Bound--  
No are Even  
Enter Element : 77  
Out of Bound--  
No are Odd  
Enter Element : 34  
Out of Bound--  
No are Even
```

3. Write a procedure which finds the average of the value of A

## SOLUTION:

```
int sum = 0;  
    Console.Write("Enter size of array : ");  
    int n = int.Parse(Console.ReadLine());  
    int[] arr = new int[n];  
    Console.WriteLine("Enter values: ");  
    for (int i = 0; i < n; i++)  
    {  
        arr[i] = int.Parse(Console.ReadLine());  
        sum += arr[i];  
    }  
    Console.WriteLine("AVERAGE : "+(sum/arr.Length));
```

## OUTPUT:



```
Select Microsoft Visual Studio Debug
Enter size of array : 5
Enter values:
34
36
76
43
12
AVERAGE : 40
```

## 2D ARRAYS

1. Write a program which input 2 matrix of user defined rows and columns and perform following operation

**a. Display / Print as a Matrix**

**b. Addition of Matrix**

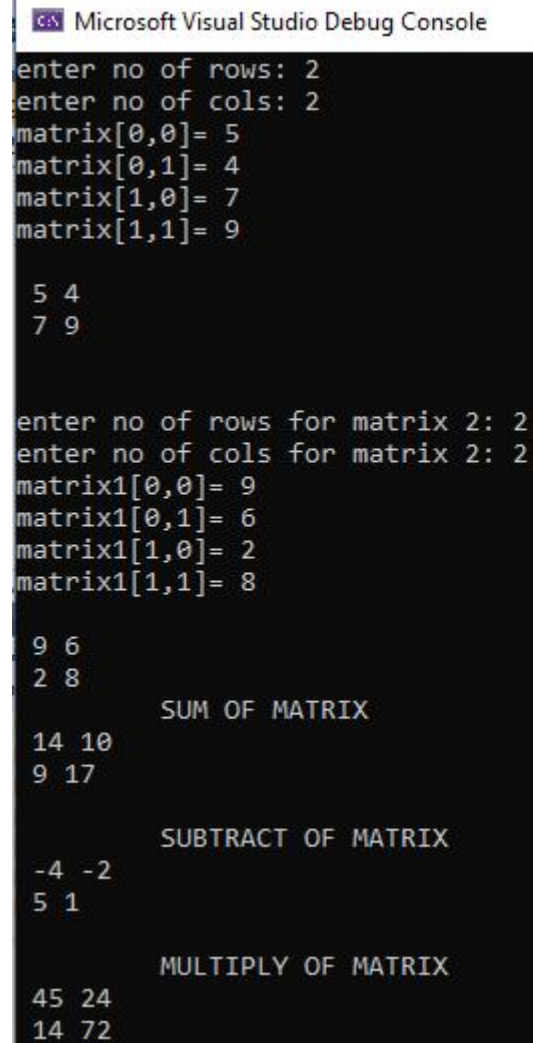
**c. Subtraction of Matrix**

**d. matrix multiplication**

### SOLUTION:

```
int a, b, i, j, m, n, x, y;
Console.Write("enter no of rows: ");
int row = int.Parse(Console.ReadLine());
Console.Write("enter no of cols: ");
int col = int.Parse(Console.ReadLine());
int[,] matrix = new int[row, col];
for (i = 0; i < row; i++)
{
    for (j = 0; j < col; j++)
    {
        Console.Write("matrix[{0},{1}]= ", i, j);
        matrix[i, j] = int.Parse(Console.ReadLine());
    }
}
Console.WriteLine();
for (i = 0; i < row; i++)
{
    for (j = 0; j < col; j++)
    {
        Console.Write(" " + matrix[i, j]);
    }
    Console.WriteLine();
}
Console.Write("\n\nenter no of rows for matrix 2: ");
int row1 = int.Parse(Console.ReadLine());
Console.Write("enter no of cols for matrix 2: ");
int col1 = int.Parse(Console.ReadLine());
```

```
int[,] matrix1 = new int[row, col];
for (a = 0; a < row1; a++)
{
    for (b = 0; b < col1; b++)
    {
        Console.Write("matrix1[{0},{1}]= ", a, b);
        matrix1[a, b] = int.Parse(Console.ReadLine());
    }
}
Console.WriteLine();
for (i = 0; i < row1; i++)
{
    for (j = 0; j < col1; j++)
    {
        Console.Write(" " + matrix1[i, j]);
    }
    Console.WriteLine();
}
m = matrix.GetLength(0);
n = matrix.GetLength(1);
Console.WriteLine(" \t SUM OF MATRIX ");
int[,] sum = new int[m, n];
for (x = 0; x < m; x++)
{
    for (y = 0; y < n; y++)
    {
        sum[x, y] = matrix[x, y] + matrix1[x, y];
        Console.Write(" " + sum[x, y]);
    }
    Console.WriteLine();
}
Console.WriteLine(" \n\t SUBTRACT OF MATRIX ");
int[,] sub = new int[m, n];
for (x = 0; x < m; x++)
{
    for (y = 0; y < n; y++)
    {
        sub[x, y] = matrix[x, y] - matrix1[x, y];
        Console.Write(" " + sub[x, y]);
    }
    Console.WriteLine();
}
Console.WriteLine(" \n\t MULTIPLY OF MATRIX ");
int[,] mul = new int[m, n];
for (x = 0; x < m; x++)
{
    for (y = 0; y < n; y++)
    {
        mul[x, y] = matrix[x, y] * matrix1[x, y];
        Console.Write(" " + mul[x, y]);
    }
    Console.WriteLine();
}
```

**OUTPUT:**

The screenshot shows the Microsoft Visual Studio Debug Console with the following text:

```
enter no of rows: 2
enter no of cols: 2
matrix[0,0]= 5
matrix[0,1]= 4
matrix[1,0]= 7
matrix[1,1]= 9

5 4
7 9

enter no of rows for matrix 2: 2
enter no of cols for matrix 2: 2
matrix1[0,0]= 9
matrix1[0,1]= 6
matrix1[1,0]= 2
matrix1[1,1]= 8

9 6
2 8

SUM OF MATRIX

14 10
9 17

SUBTRACT OF MATRIX

-4 -2
5 1

MULTIPLY OF MATRIX

45 24
14 72
```

**e. Determinant****f. Inverse****SOLUTION:**

```
int a, b, i, j;
    Console.Write("enter no of rows: ");
    int row = int.Parse(Console.ReadLine());
    Console.Write("enter no of cols: ");
    int col = int.Parse(Console.ReadLine());
    int[,] matrix = new int[row, col];
    for (i = 0; i < row; i++)
    {
```

```
        for (j = 0; j < col; j++)
        {
            Console.Write("matrix[{0},{1}]= ", i, j);
            matrix[i, j] = int.Parse(Console.ReadLine());
        }
    }
    Console.WriteLine();
    for (i = 0; i < row; i++)
    {
        for (j = 0; j < col; j++)
        {
            Console.Write(" " + matrix[i, j]);
        }
        Console.WriteLine();
    }
    Console.WriteLine("\n \t DETERMINANT OF MATRIX");

    a = matrix[0, 0] * matrix[1, 1];
    b = matrix[0, 1] * matrix[1, 0];
    int det = a - b;
    Console.WriteLine("\n DETERMINANT : " + det);

    Console.WriteLine("\n \t ADJOINT OF MATRIX");
    int temp;

    temp = matrix[0, 0];
    matrix[0, 0] = matrix[1, 1];
    matrix[1, 1] = temp;
    matrix[0, 1] *= -1;
    matrix[1, 0] *= -1;
    for (i = 0; i < row; i++)
    {
        for (j = 0; j < col; j++)
        {
            Console.Write(" " + matrix[i, j]);
        }
        Console.WriteLine();
    }
    Console.WriteLine("\n\t INVERSE of MATRIX : ");
    for (i = 0; i < row; i++)
    {
        for (j = 0; j < col; j++)
        {
            float d = matrix[i, j];
            float res = d / det;
            Console.Write(" " + res);
        }
        Console.WriteLine();
    }
}
```

## OUTPUT:

```
Microsoft Visual Studio Debug Console

enter no of rows: 2
enter no of cols: 2
matrix[0,0]= 3
matrix[0,1]= 5
matrix[1,0]= 1
matrix[1,1]= 2

3 5
1 2

      DETERMINANT OF MATRIX

DETERMINANT : 1

      ADJOINT OF MATRIX

2 -5
-1 3

      INVERSE of MATRIX :

2 -5
-1 3
```