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# Array Problems

## 1.WAP to understand different types of one dimensional array declarations

using System;

namespace Arrays

{

class Program

{

static void Main(string[] args)

{

//Single Dimension

Console.WriteLine("Type 1 : Declaration");

int[] arr1 = { 12, 45, 56, 78, 89 };

foreach (int item in arr1)

{

Console.Write("{0}\t", item);

}

Console.WriteLine("\n\nType 2 : Declaration");

int[] arr2 = new int[5];

Console.WriteLine("Enter 5 Values:");

for (int i = 0; i < arr2.Length; i++)

{

arr2[i] = Convert.ToInt32(Console.ReadLine());

}

foreach (int item in arr2)

{

Console.Write("{0}\t", item);

}

Console.WriteLine("\n\nType 3 : Declaration");

Console.Write("Enter Size:");

int size = Convert.ToInt32(Console.ReadLine());

int[] arr3 = new int[size];

Console.WriteLine("Enter {0} Values:", size);

for (int i = 0; i < arr3.Length; i++)

{

arr3[i] = Convert.ToInt32(Console.ReadLine());

}

foreach (int item in arr3)

{

Console.Write("{0}\t", item);

}

Console.ReadKey();

}

}

}

## C# program for different types of two-dimensional array declarations

using System;

namespace Arrays2

{

class Program

{

static void Main(string[] args)

{

//Multi Dimension

Console.WriteLine("Type 1 : Declaration");

int[,] arr1 = {

{1, 2, 3, 4},

{11, 22, 33, 44}

};

for (int i = 0; i < 2; i++)

{

for (int j = 0; j < 4; j++)

{

Console.Write("{0}\t", arr1[i, j]);

}

Console.WriteLine();

}

Console.WriteLine("\n\nType 2 : Declaration");

int[,] arr2 = new int[2, 5];

Console.WriteLine("Enter {0} values:", 2 \* 5);

for (int i = 0; i < 2; i++)

{

for (int j = 0; j < 5; j++)

{

arr2[i, j] = Convert.ToInt32(Console.ReadLine());

}

}

for (int i = 0; i < 2; i++)

{

for (int j = 0; j < 5; j++)

{

Console.Write("{0}\t", arr2[i, j]);

}

Console.WriteLine();

}

Console.WriteLine("\n\nType 3 : Declaration");

Console.Write("Enter Rows :");

int rows = Convert.ToInt32(Console.ReadLine());

Console.Write("Enter Cols :");

int cols = Convert.ToInt32(Console.ReadLine());

int[,] arr3 = new int[rows, cols];

Console.WriteLine("Enter {0} values:", rows \* cols);

for (int i = 0; i < rows; i++)

{

for (int j = 0; j < cols; j++)

{

arr3[i, j] = Convert.ToInt32(Console.ReadLine());

}

}

for (int i = 0; i < rows; i++)

{

for (int j = 0; j < cols; j++)

{

Console.Write("{0}\t", arr3[i, j]);

}

Console.WriteLine();

}

Console.ReadKey();

}

}

}

## WAP to find the Length of an Array

using System;

class Program

{

static void Main()

{

int[] arrayA = new int[5];

int lengthA = arrayA.Length;

Console.WriteLine("Length of ArrayA : {0}", +lengthA);

int[,] twoD = new int[5, 10];

Console.WriteLine("The Size of 2D Array is : {0}", twoD.Length);

Console.ReadLine();

}

}

## 4.Write a C# program to Reverse an Array

using System;

class Program

{

static void Main()

{

int[] array = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };

foreach (int a in array)

{

Console.WriteLine(a);

}

Array.Reverse(array);

Console.WriteLine("Reversed Array : ");

foreach (int value in array)

{

Console.WriteLine(value);

}

Console.ReadLine();

}

}

**Another way:**using System;

namespace ConsoleApplication1

{

class Program

{

static void Main()

{

int i = 0;

int j = 0;

int[] arr1 = new int[5];

int[] arr2 = new int[5];

//Read numbers into array

Console.WriteLine("Enter numbers : ");

for (i = 0; i < 5; i++)

{

Console.Write("Element[" + (i + 1) + "]: ");

arr1[i] = int.Parse(Console.ReadLine());

}

//Assign elements of arr1 from last to first element to arr2

for (i = 0, j = arr1.Length - 1; i < arr1.Length; i++)

{

arr2[i] = arr1[j--];

}

//Reverse array elements in arr2

Console.WriteLine("Reverse elements : ");

for (i = 0; i < 5; i++)

{

Console.WriteLine("Element[" + (i + 1) + "]: " + arr2[i]);

}

Console.WriteLine();

}

}

}

## 5.Understanding about Jagged Arrays

using System;

class Program

{

static void Main()

{

int[][] jag = new int[3][]; //creates a jagged array called jag with 3 rows.

jag[0] = new int[2];//initializes the first row with an array of 2 elements.

jag[0][0] = 11;

jag[0][1] = 12;

jag[1] = new int[1] { 11 };////initializes the second row with an array containing one element, which is 11.

jag[2] = new int[3] { 14, 15, 16 }; //initializes the third row with an array of 3 elements (14, 15, and 16).

for (int i = 0; i < jag.Length; i++) // iterates over each row of the jagged array.

{

int[] innerArray = jag[i]; // gets the current row (inner array) being iterated

for (int a = 0; a < innerArray.Length; a++) //iterates over each element within the current row.

{

Console.Write(innerArray[a] + " ");

}

Console.WriteLine();

}

Console.Read();

}

}

## 6.Another program for jagged array

using System;

namespace Array3

{

class Program

{

static void Main(string[] args)

{

int[][] jag = new int[3][];

jag[0] = new int[] { 12, 34, 5, 6, 7 };

jag[1] = new int[] { 15, 52 };

jag[2] = new int[] { 1, 2, 3 };

for (int i = 0; i < 3; i++)

{

for (int j = 0; j < jag[i].Length; j++)

{

Console.Write("{0}\t", jag[i][j]);

}

Console.WriteLine();

}

Console.ReadKey();

}

}

}

## 7. C# program to find positive and negative numbers from an array

using System;

namespace ConsoleApplication1

{

class Program

{

static void Main()

{

int i = 0;

int[] arr = new int[5];

Console.WriteLine("Enter array elements : ");

for (i = 0; i < arr.Length; i++)

{

Console.Write("Element[" + (i + 1) + "]: ");

arr[i] = int.Parse(Console.ReadLine());

}

Console.WriteLine("List of positive numbers : ");

for (i = 0; i < arr.Length; i++)

{

if (arr[i] >= 0)

Console.Write(arr[i] + " ");

}

Console.WriteLine();

Console.WriteLine("List of negative numbers : ");

for (i = 0; i < arr.Length; i++)

{

if (arr[i] < 0)

Console.Write(arr[i] + " ");

}

Console.WriteLine();

}

}

}

## 8.WAP to print even and odd numbers from an array

using System;

namespace ConsoleApplication1

{

class Program

{

static void Main()

{

int i = 0;

//declare array of integers

int[] arr = new int[5];

//reading elements

Console.WriteLine("Enter array elements : ");

for (i = 0; i < arr.Length; i++)

{

Console.Write("Element[" + (i + 1) + "]: ");

arr[i] = int.Parse(Console.ReadLine());

}

//checking and printing list of EVEN integers

Console.WriteLine("List of even numbers : ");

for (i = 0; i < arr.Length; i++)

{

//condition for EVEN number

if (arr[i] % 2 == 0)

Console.Write(arr[i] + " ");

}

Console.WriteLine();

//checking and printing all odd numbers

Console.WriteLine("List of odd numbers : ");

for (i = 0; i < arr.Length; i++)

{

//condition to check ODD number

if (arr[i] % 2 != 0)

Console.Write(arr[i] + " ");

}

Console.WriteLine();

}

}

}

## 9. Find smallest and largest element from integer array in C#

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

namespace ConsoleApplication1

{

class Program

{

static void Main()

{

int i = 0;

int large = 0;

int small = 0;

//array declaration

int[] arr = new int[5];

//reading array elements

Console.WriteLine("Enter array elements : ");

for (i = 0; i < arr.Length; i++)

{

Console.Write("Element[" + (i + 1) + "]: ");

arr[i] = int.Parse(Console.ReadLine());

}

//assigning first element to the array

large = arr[0];

//loop to compare value of large with other elements

for (i = 1; i < arr.Length; i++)

{

//if large is smaller than other element

//assig that element to the large

if (large < arr[i])

large = arr[i];

}

small = arr[0];

for (i = 1; i < arr.Length; i++)

{

//compare if small is greater than of any element of the array

//assign that element in it.

if (small > arr[i])

small = arr[i];

}

//finally print the smallest elemeent of the integer array

Console.WriteLine("Smallest element in array is : " + small);

//finally, we will have largest element, printing here

Console.WriteLine("Largest element in array : " + large);

}

}

}

## 10. Write a program to insert an element at given position into an array

using System;

namespace ConsoleApplication1

{

class Program

{

static void Main()

{

int i = 0;

int pos = 0;

int item = 0;

int[] arr = new int[10];

//Read numbers into array

Console.WriteLine("Enter numbers : ");

for (i = 0; i < 5; i++)

{

Console.Write("Element[" + (i + 1) + "]: ");

arr[i] = int.Parse(Console.ReadLine());

}

Console.Write("Enter position : ");

pos = int.Parse(Console.ReadLine());

Console.Write("Enter new item : ");

item = int.Parse(Console.ReadLine());

//Perform shift opearation

for (i = 5; i >= pos; i--)

{

arr[i] = arr[i - 1];

}

arr[pos - 1] = item;

//print array after insertion

Console.WriteLine("Array elements after insertion : ");

for (i = 0; i < 6; i++)

{

Console.WriteLine("Element[" + (i + 1) + "]: " + arr[i]);

}

Console.WriteLine();

}

}

}

## 11. C# program to delete an element from an array

using System;

namespace ConsoleApplication1

{

class Program

{

static void Main()

{

int i = 0;

int pos = 0;

int[] arr = new int[10];

//Read numbers into array

Console.WriteLine("Enter numbers : ");

for (i = 0; i < 5; i++)

{

Console.Write("Element[" + (i + 1) + "]: ");

arr[i] = int.Parse(Console.ReadLine());

}

Console.Write("Enter position to delete item : ");

pos = int.Parse(Console.ReadLine());

//Perform shift opearation

for (i = pos - 1; i < 5; i++)

{

arr[i] = arr[i + 1];

}

//print array after deletion

Console.WriteLine("Array elements after deletion : ");

for (i = 0; i < 4; i++)

{

Console.WriteLine("Element[" + (i + 1) + "]: " + arr[i]);

}

Console.WriteLine();

}

}

}

## 12 C# program to merge two arrays

using System;

namespace ConsoleApplication1 {

class Program {

static void Main() {

int i = 0;

int j = 0;

int[] arr1 = new int[5];

int[] arr2 = new int[5];

int[] arr3 = new int[10];

//Read numbers into array

Console.WriteLine("Enter elements of ARR1 : ");

for (i = 0; i < 5; i++) {

Console.Write("Element[" + (i + 1) + "]: ");

arr1[i] = int.Parse(Console.ReadLine());

}

//Read numbers into array

Console.WriteLine("Enter elements of ARR2 : ");

for (i = 0; i < 5; i++) {

Console.Write("Element[" + (i + 1) + "]: ");

arr2[i] = int.Parse(Console.ReadLine());

}

//Merge arr1 and arr2 to arr3

for (i = 0, j = 0; i < 5; i++) {

arr3[j++] = arr1[i];

}

for (i = 0; i < 5; i++) {

arr3[j++] = arr2[i];

}

//Print merged array

Console.WriteLine("Elements of ARR3 : ");

for (i = 0; i < 10; i++) {

Console.WriteLine("Element[" + (i + 1) + "]: " + arr3[i]);

}

Console.WriteLine();

}

}

}

## 13. Find Average of Array Elements

//Program to calculate the average of array elements.

using System;

class Avg

{

public static void Main()

{

int[] arr = { 1, 2, 6, 2, 18 };

int i=0;

int sum = 0;

float average = 0.0F;

for (i = 0; i < arr.Length; i++)

{

sum += arr[i];

}

average = (float)sum / arr.Length;

Console.WriteLine("Average of Array elements: "+ average);

}

}

## 14. C# program to find total occurrence of a given number in an array

using System;

namespace ConsoleApplication1

{

class Program

{

static void Main()

{

int i = 0;

int count = 0;

int item = 0;

int[] arr1 = new int[5];

//Read numbers into array

Console.WriteLine("Enter numbers : ");

for (i = 0; i < 5; i++)

{

Console.Write("Element[" + (i + 1) + "]: ");

arr1[i] = int.Parse(Console.ReadLine());

}

Console.Write("Enter item : ");

item = int.Parse(Console.ReadLine());

for (i = 0; i < 5; i++)

{

if (item == arr1[i])

{

count++;

}

}

Console.WriteLine("Total occurrence of item " + item + " is : " + count);

Console.WriteLine();

}

}

}

## 15. C# program to find the smallest and largest elements of an array

using System;

class Sample

{

static void Main()

{

int[] MyArray = { 40,30,20,10,50 };

int large = MyArray.Max();

int small = MyArray.Min();

Console.WriteLine("Largest Element : " + large);

Console.WriteLine("Smallest Element : " + small);

}

}

## 16. C# program to add two matrices

//C# program to add two matrices.

using System;

class MatrixDemo

{

public static void Main(string[] args)

{

int i = 0;

int j = 0;

int row = 2;

int col = 2;

int[,] Matrix1 = new int[row, col];

int[,] Matrix2 = new int[row, col];

int[,] Matrix3 = new int[row, col];

Console.WriteLine("Enter the elements of Matrix1: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix1[i, j] = int.Parse(Console.ReadLine());

}

}

Console.WriteLine("Enter the elements of Matrix2: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix2[i, j] = int.Parse(Console.ReadLine());

}

}

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix3[i, j] = Matrix1[i, j] + Matrix2[i, j];

}

}

Console.WriteLine("\nMatrix1:");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix1[i, j] + "\t");

}

Console.WriteLine();

}

Console.WriteLine("\nMatrix2:");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix2[i, j] + "\t");

}

Console.WriteLine();

}

Console.WriteLine("\nAddition of Matrix1 and Matrix2:");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix3[i, j] + "\t");

}

Console.WriteLine();

}

}

}

## 17. C# program to transpose a matrix

//C# program to transpose a matrix.

using System;

class MatrixDemo

{

public static void Main(string[] args)

{

int i = 0;

int j = 0;

int row = 2;

int col = 2;

int[,] Matrix = new int[row, col];

Console.Write("Enter the elements of matrix: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix[i, j] = int.Parse(Console.ReadLine());

}

}

Console.WriteLine("\nMatrix: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix[i, j] + "\t");

}

Console.WriteLine();

}

Console.WriteLine("Transpose of matrix : ");

for (i = 0; i < col; i++)

{

for (j = 0; j < row; j++)

{

Console.Write(Matrix[j, i] + "\t");

}

Console.WriteLine();

}

}

}

## 18. C# program to print the upper and lower triangular matrix

//C# program to print upper triangular matrix.

using System;

class MatrixDemo

{

public static void Main(string[] args)

{

int i = 0;

int j = 0;

int row = 3;

int col = 3;

int[,] Matrix = new int[row, col];

Console.Write("Enter the elements of matrix: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix[i, j] = int.Parse(Console.ReadLine());

}

}

Console.WriteLine("\nMatrix: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix[i, j] + "\t");

}

Console.WriteLine();

}

Console.WriteLine("Upper triangular matrix: ");

for (i = 0; i < row; i++)

{

Console.WriteLine();

for (j = 0; j < col; j++)

{

if (i <= j)

Console.Write(Matrix[i, j] + "\t");

else

Console.Write(" \t");

}

}

Console.WriteLine();

Console.WriteLine("Lower triangular matrix: ");

for (i = 0; i < row; i++)

{

Console.WriteLine();

for (j = 0; j < col; j++)

{

if (i >= j)

Console.Write(Matrix[i, j] + "\t");

else

Console.Write(" \t");

}

}

Console.WriteLine();

}

}

## 19. C# program to find the largest element in the matrix

//C# program to find the largest element in the matrix.

using System;

class MatrixDemo

{

public static void Main(string[] args)

{

int i = 0;

int j = 0;

int row = 3;

int col = 3;

int large = 0;

int[,] Matrix= new int[row, col];

Console.Write("Enter the elements of matrix: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix[i, j] = int.Parse(Console.ReadLine());

if (large < Matrix[i, j])

large = Matrix[i, j];

}

}

Console.WriteLine("\nMatrix: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix[i, j] + "\t");

}

Console.WriteLine();

}

Console.WriteLine("Largest element is : "+large);

}

}

## 20. C# program to multiply two matrices

//C# program to multiply two matrices.

using System;

class MatrixDemo

{

public static void Main(string[] args)

{

int i = 0;

int j = 0;

int row = 2;

int col = 2;

int[,] Matrix1 = new int[row, col];

int[,] Matrix2 = new int[row, col];

int[,] Matrix3 = new int[row, col];

Console.Write("Enter the elements of matrix1: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix1[i, j] = int.Parse(Console.ReadLine());

}

}

Console.Write("Enter the elements of matrix2: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix2[i, j] = int.Parse(Console.ReadLine());

}

}

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Matrix3[i, j] = 0;

for (int k = 0; k < 2; k++)

{

Matrix3[i, j] += Matrix1[i, k] \* Matrix2[k, j];

}

}

}

Console.WriteLine("\nMatrix1: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix1[i, j] + "\t");

}

Console.WriteLine();

}

Console.WriteLine("\nMatrix2: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix2[i, j] + "\t");

}

Console.WriteLine();

}

Console.WriteLine("\nMatrix3: ");

for (i = 0; i < row; i++)

{

for (j = 0; j < col; j++)

{

Console.Write(Matrix3[i, j] + "\t");

}

Console.WriteLine();

}

}

}

## 21. Find Smallest, Largest, Second Largest number from the array given by the user .

using System;

class Program

{

static void Main()

{

Console.Write("Enter the number of elements: ");

int n = int.Parse(Console.ReadLine());

int[] numbers = new int[n];

// Input numbers

for (int i = 0; i < n; i++)

{

Console.Write("Enter number " + (i + 1) + ": ");

numbers[i] = int.Parse(Console.ReadLine());

}

// Sort the numbers

Array.Sort(numbers);

// Print the second largest number

Console.WriteLine("Second largest number: " + numbers.ElementAt(n - 2));

// Print the largest number

Console.WriteLine("Largest number: " + numbers.ElementAt(n - 1));

// Print the smallest number

Console.WriteLine("Smallest number: " + numbers.ElementAt(0));

}

}