Arrays

Detyra 1.

Write a program, which creates an array of **20 elements of type integer** and initializes each of the elements with a value equals to the index of the element multiplied by 5. Print the elements to the console.

Kodi: int[] arr = new int[20];

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

{

arr[i] = 5 \* i;

Console.WriteLine(arr[i]);

}

Rezultati:



Detyra 2:

Write a program, which **reads two arrays** from the console and **checks whether they are equal** (two arrays are equal when they are of equal length and all of their elements, which have the same index, are equal).

Kodi:

Console.Write("Shkruaj gjatsine e Array1: ");

int gjatesia = Int32.Parse(Console.ReadLine());

int[] arr1 = new int[gjatesia];

for (int i = 0; i < arr1.Length; i++)

{

Console.Write("Shkruaj vlerat: ");

arr1[i] = Int32.Parse(Console.ReadLine());

}

Console.Write("Shkruaj gjatesine e Array2: ");

int gjatesia2 = Int32.Parse(Console.ReadLine());

if (gjatesia != gjatesia2) Console.WriteLine("Gjatesia e arrays eshte e ndryshme.");

else

{

int[] arr2 = new int[gjatesia2];

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

{

Console.Write("Shruaj vlerat: ");

arr2[i] = Int32.Parse(Console.ReadLine());

}

for (int i = 0; i < arr1.Length; i++)

{

if (arr1[i] != arr2[i]) Console.WriteLine("Arrays kan vlera te ndryshme: ");

if (arr1[i] == arr2[i]) Console.WriteLine("Arrays jane te barabarta: "); break;

}

}

Detyra 3.

Write a program, which **compares two arrays of type char lexicographically** (character by character) and checks, which one is first in the lexicographical order.

Kodi: bool teBarabarta = true;

char[] array1 = new char[5] { 'a', 'b', 'c', 'd', 'e' };

char[] array2 = new char[5] { 'g', 'b', 'c', 'd', 'e' };

if (array1.Length > array2.Length) Console.WriteLine("Array 2 eshte leksikografikisht i pari. ");

else if (array1.Length < array2.Length) Console.WriteLine("Array 1 eshte leksikografikisht i pari. ");

else

{

for (int i = 0; i < array1.Length; i++)

{

if (array1[i] < array2[i])

{

Console.WriteLine("Array 1 eshte leksikografikisht i pari.");

teBarabarta = false;

break;

}

if (array1[i] > array2[i])

{

Console.WriteLine("Array 2 eshte leksikografikisht i pari. ");

teBarabarta = false;

break;

}

}

}

if (teBarabarta) Console.WriteLine("Te dy array jan te barabarta leksikografikisht. ");

Rezultati:



Detyra 4.

Write a program, which finds the **maximal sequence of consecutive equal elements** in an array. E.g.: {1, 1, 2, 3, **2, 2, 2**, 1}  {2, 2, 2}.

Kodi:

int count = 1, tempCount = 1, number = 0;

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

int length = Int32.Parse(Console.ReadLine());

int[] arr = new int[length];

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

{

Console.Write("Enter {0} element: ", i);

arr[i] = Int32.Parse(Console.ReadLine());

}

for (int i = 0; i < arr.Length - 1; i++)

{

if (arr[i] == arr[i + 1]) tempCount++;

else tempCount = 1;

if (tempCount > count)

{

count = tempCount;

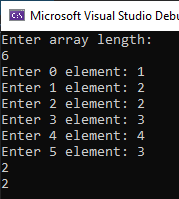
number = arr[i];

}

}

for (int i = 0; i < count; i++) Console.WriteLine("{0}", number);

Rezultati:



Detyra e 5.

Write a program, which finds the **maximal sequence** of consecutively placed **increasing** integers. Example: {3, **2, 3, 4**, 2, 2, 4}  {2, 3, 4}.

Kodi:

Console.Write("Shkruaj gjatsine e array: ");

int gjatsia = Int32.Parse(Console.ReadLine());

int[] array = new int[gjatsia];

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

{

Console.Write("array[{0}]: ", i);

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

}

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

{

for (int j = i + 1; j < gjatsia; j++)

{

if (array[i + 1] == array[j] && array[i] < array[j])

{

Console.WriteLine(array[i]);

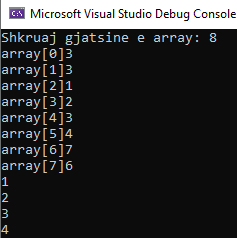
break;

}

}

}

Rezultati:



Detyra e 6.

Write a program, which finds the **maximal sequence of increasing elements** in an array **arr[n]**. It is not necessary the elements to be consecutively placed. E.g.: {9, 6, **2**, 7, **4**, 7, **6**, 5, **8**, 4}  {2, 4, 6, 8}.

Kodi: int counter = 0, tempIndex, tempCounter;

Console.Write("Enter array length: ");

int length = Int32.Parse(Console.ReadLine());

int[] arr = new int[length];

int[] result = new int[length];

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

{

Console.Write("Enter {0} element: ", i);

arr[i] = Int32.Parse(Console.ReadLine());

}

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

{

int[] tempResult = new int[length];

tempIndex = tempCounter = 1;

tempResult[0] = arr[i];

for (int j = i + 1; j < length; j++)

{

if (arr[j] > tempResult[tempIndex - 1])

{

tempResult[tempIndex] = arr[j];

tempIndex++;

tempCounter++;

}

else if (tempIndex > 1 && arr[j] > tempResult[tempIndex - 2] && arr[j] < tempResult[tempIndex - 1]) tempResult[tempIndex - 1] = arr[j];

}

if (counter < tempCounter)

{

counter = tempCounter;

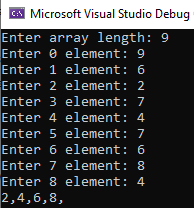
result = tempResult;

}

}

for (int i = 0; i < counter; i++) Console.Write("{0},", result[i]);

Rezultati:



Detyra 7.

Write a program, which reads from the console two integer numbers **N** and **K** (K<N) and array of N integers. Find those **K consecutive elements** in the array, which have **maximal sum**.

Kodi:

int sum = 0;

Console.Write("Enter n: ");

int n = Int32.Parse(Console.ReadLine());

Console.Write("Enter k (k < n): ");

int k = Int32.Parse(Console.ReadLine());

int[] arr = new int[n];

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

{

Console.Write("Enter element [{0}]: ", i);

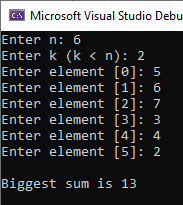
arr[i] = Int32.Parse(Console.ReadLine());

}

Array.Sort(arr, (a, b) => b.CompareTo(a));

for (int i = 0; i < k; i++) sum += arr[i];

Console.WriteLine("\nBiggest sum is {0}", sum);

Rezultati:

Detyra 8.

**Sorting an array** means to arrange its elements in an increasing (or decreasing) order. Write a program, which sorts an array using the algorithm "**selection sort**".

Kodi: int i, j, iMin, temp;

Console.Write("Enter array length: ");

int length = Int32.Parse(Console.ReadLine());

int[] arr = new int[length];

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

{

Console.Write("Enter element [{0}]: ", i);

arr[i] = Int32.Parse(Console.ReadLine());

}

for (j = 0; j < length - 1; j++)

{

iMin = j;

for (i = j + 1; i < length; i++)

{

if (arr[i] < arr[iMin])

{

iMin = i;

}

}

if (iMin != j)

{

temp = arr[j];

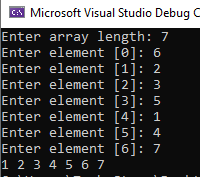
arr[j] = arr[iMin];

arr[iMin] = temp;

}

}

for (i = 0; i < length; i++) Console.Write("{0} ", arr[i]);

Rezultati:

Detyra 9.

Write a program, which finds a **subsequence of numbers with maximal sum**. E.g.: {2, 3, -6, -1, **2, -1, 6, 4**, -8, 8}  **11**

Kodi: int sum = 0, tempSum;

Console.Write("Enter array lenght: ");

int length = Int32.Parse(Console.ReadLine());

int[] arr = new int[length];

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

{

Console.Write("Enter element [{0}]: ", i);

arr[i] = Int32.Parse(Console.ReadLine());

}

for (int i = 0; i < length - 1; i++)

{

tempSum = arr[i];

for (int j = i + 1; j < length; j++)

{

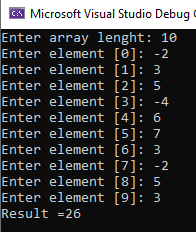
tempSum += arr[j];

if (tempSum > sum) sum = tempSum;

}

}

Console.WriteLine("Result ={0} ", sum);



Detyra 10. Write a program, which finds the **most frequently occurring** element in an array. Example: {**4**, 1, 1, **4**, 2, 3, **4**, **4**, 1, 2, **4**, 9, 3} à 4 (5 times).

Kodi:

int counter = 0, tempCounter = 1, foundNumber = 0;

Console.Write("Enter array length: ");

int length = Int32.Parse(Console.ReadLine());

int[] arr = new int[length];

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

{

Console.Write("Enter the Value of array[{0}]: ", i);

arr[i] = Int32.Parse(Console.ReadLine());

}

Array.Sort(arr);

for (int i = 0; i < length - 1; i++)

{

if (arr[i] == arr[i + 1]) tempCounter++;

else tempCounter = 1;

if (tempCounter > counter)

{

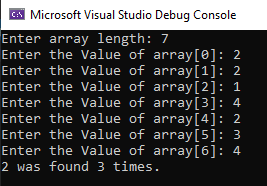
counter = tempCounter;

foundNumber = arr[i];

}

}

Console.WriteLine("{0} was found {1} times.", foundNumber, counter);

Rezultati:

Detyra 11.

Write a program to find a sequence of neighbor numbers in an array, which has a **sum of certain number S**. Example: {4, 3, 1, **4, 2, 5**, 8}, S=**11**  {4, 2, 5}.

Kodi:

int sum = 0, start = 0, end = 0;

bool sumFound = false;

Console.Write("Enter S: ");

int s = Int32.Parse(Console.ReadLine());

Console.Write("Enter Array Length: ");

int length = Int32.Parse(Console.ReadLine());

int[] arr = new int[length];

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

{

Console.Write("Enter element [{0}]: ");

arr[i] = Int32.Parse(Console.ReadLine());

}

for (int i = 0; i < length - 1; i++)

{

sum = arr[i];

for (int j = i + 1; j < length; j++)

{

sum += arr[j];

if (sum == s)

{

start = i;

end = j;

sumFound = true;

break;

}

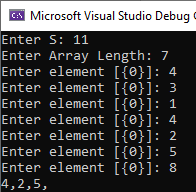
}

if (sumFound) break;

}

if (sumFound) for (int i = start; i <= end; i++) Console.Write("{0},", arr[i]);

else Console.WriteLine("No sum found.");

Rezultati:

Detyra 12.

Kodi: Console.Write("Shkruaj numrin e rreshtave te matrices: ");

int rows = Int32.Parse(Console.ReadLine());

Console.Write("Shkruaj numrin e kolonave te matrices: ");

int cols = Int32.Parse(Console.ReadLine());

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

Console.Write("Enter the cells of matrix;");

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

{

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

{

Console.Write("Matrica[{0},{1}]= ", row, col);

matrix[row, col] = int.Parse(Console.ReadLine());

}

}

for (int row = 0; row < matrix.GetLength(0); row++)

{

for (int col = 0; col < matrix.GetLength(1); col++)

{

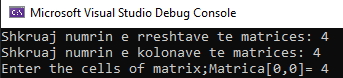
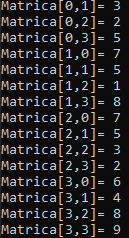
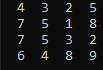
Console.Write(" " + matrix[row, col]);

}

Console.WriteLine();

}

Rezultati:

Detyra 13.

Write a program, which creates a rectangular array with size of **n** by **m** elements. The dimensions and the elements should be read from the console. Find a **platform with size of (3, 3) with a maximal sum**.

Kodi: int row = 0, col = 0, sum = -1000;

Console.Write("Enter N: ");

int n = Int32.Parse(Console.ReadLine());

Console.Write("Enter M: ");

int m = Int32.Parse(Console.ReadLine());

int[,] arr = new int[n, m];

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

{

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

{

Console.Write("Arr [{0}] [{1}] = ", i, j);

arr[i, j] = Int32.Parse(Console.ReadLine());

}

}

for (int tempRow = 0; tempRow < arr.Length - 2; tempRow++)

{

for (int tempCol = 0; tempCol < arr.GetLength(0) - 2; tempCol++)

{

int tempSum = arr[row, col] + arr[row, col + 1] + arr[row, col + 2] + arr[row + 1, col] +

arr[row + 1, col + 1] + arr[row + 1, col + 2] + arr[row + 2, col] + arr[row + 2, col + 1] + arr[row + 2, col + 2];

if (tempSum > sum)

{

row = tempRow;

col = tempCol;

sum = tempSum;

}

}

}

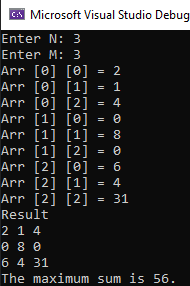
Console.WriteLine("Result");

Console.WriteLine("{0} {1} {2}", arr[row, col], arr[row, col + 1], arr[row, col + 2]);

Console.WriteLine("{0} {1} {2}", arr[row + 1, col], arr[row + 1, col + 1], arr[row + 1, col + 2]);

Console.WriteLine("{0} {1} {2}", arr[row + 2, col], arr[row + 2, col + 1], arr[row + 2, col + 2]);

Console.WriteLine("The maximum sum is {0}.", sum);

Rezultati:

Detyra 14.

Write a program, which finds the **longest sequence of equal string** elements in a matrix. A sequence in a matrix we define as a set of neighbor elements **on the same row, column or diagonal**.

Kodi : int tempSeq = 1, seq = 1;

string element = "e";

Console.Write("Enter N: ");

int n = Int32.Parse(Console.ReadLine());

Console.Write("Enter M: ");

int m = Int32.Parse(Console.ReadLine());

string[,] arr = new string[n, m];

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

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

{

Console.Write("Arr [{0}][{1}] = ", i, j);

arr[i, j] = Console.ReadLine();

}

for (int rows = 0; rows < arr.GetLength(0); rows++)

{

for (int cols = 0; cols < arr.GetLength(1) - 1; cols++)

{

if (arr[rows, cols] == arr[rows, cols + 1]) tempSeq++;

else tempSeq = 1;

if (seq < tempSeq)

{

seq = tempSeq;

element = arr[rows, cols];

}

}

tempSeq = 1;

}

for (int cols = 0; cols < arr.GetLength(1); cols++)

{

for (int rows = 0; rows < arr.GetLength(0) - 1; rows++)

{

if (arr[rows, cols] == arr[rows + 1, cols]) tempSeq++;

else tempSeq = 1;

if (seq < tempSeq)

{

seq = tempSeq;

element = arr[rows, cols];

}

}

tempSeq = 1;

}

for (int i = 0; i < arr.GetLength(0) - 1; i++)

for (int j = 0; j < arr.GetLength(1) - 1; j++)

{

for (int rows = i, cols = j; rows < arr.GetLength(0) - 1 && cols < arr.GetLength(1) - 1; rows++, cols++)

{

if (arr[rows, cols] == arr[rows + 1, cols + 1]) tempSeq++;

else tempSeq = 1;

if (seq < tempSeq)

{

seq = tempSeq;

element = arr[rows, cols];

}

}

tempSeq = 1;

}

for (int i = 0; i < arr.GetLength(0) - 1; i++)

for (int j = 1; j < arr.GetLength(1); j++)

{

for (int rows = i, cols = j; rows < arr.GetLength(0) - 1 && cols > 0; rows++, cols--)

{

if (arr[rows, cols] == arr[rows + 1, cols - 1]) tempSeq++;

else tempSeq = 1;

if (seq < tempSeq)

{

seq = tempSeq;

element = arr[rows, cols];

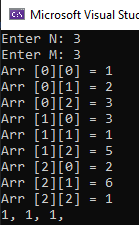
}

}

tempSeq = 1;

}

for (int i = 0; i < seq; i++) Console.Write("{0}, ", element);

Rezultati:

Detyra 15.

Write a program, which creates an array containing **all Latin letters**. The user inputs **a word** from the console and as result the program prints to the console the **indices of the letters from the word**.

Kodi :

char[] alfabeti = { 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z' };

Console.Write("Shkruaj nje fjale: ");

char[] fjala = (Console.ReadLine()).ToCharArray();

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

{

for (int j = 0; j < alfabeti.Length; j++)

{

if (fjala[i] == alfabeti[j]) Console.Write("{0}", j);

Rezultati: