02 Arrays and Strings

Test your Knowledge

1. When to use String vs. StringBuilder in C# ?

Explain: A string Instance is immutable, You can not change it after it is already created. When we mutable string then we use string builder

2. What is the base class for all arrays in C#?

The array class is the base class for all arrays in C#.

1. How do you sort an array in C#?

We call a method Array.sort(). Which will sort array in ascending order.

4. What property of an array object can be used to get the total number of elements in

an array?

Array. Length();

5. Can you store multiple data types in System.Array?

Yes we can store multiple data types in System.Array,

6. What’s the difference between the System.Array.CopyTo() and System.Array.Clone()?

So the clone() method return a new array. Which contains all the elements from the original array, Copyto() method when called copies the elements into another existing array.

Practice Arrays

1**. Copying an Array**

Write code to create a copy of an array. First, start by creating an initial array. (You can use

whatever type of data you want.) Let’s start with 10 items. Declare an array variable and

assign it a new array with 10 items in it. Use the things we’ve discussed to put some values

in the array.

Now create a second array variable. Give it a new array with the same length as the first.

Instead of using a number for this length, use the Lengthproperty to get the size of the

original array.

Use a loop to read values from the original array and place them in the new array. Also

print out the contents of both arrays, to be sure everything copied correctly.

Graphical user interface, text, application

Description automatically generated

2. Write a simple program that lets the user manage a list of elements. It can be a grocery list,

"to do" list, etc. Refer to Looping Based on a Logical Expression if necessary to see how to

implement an infinite loop. Each time through the loop, ask the user to perform an

operation, and then show the current contents of their list. The operations available should

be Add, Remove, and Clear. The syntax should be as follows:

+ some item

- some item

--

Your program should read in the user's input and determine if it begins with a “+” or “-“ or

if it is simply “—“ . In the first two cases, your program should add or remove the string

given ("some item" in the example). If the user enters just “—“ then the program should

clear the current list. Your program can start each iteration through its loop with the

following instruction:

Console.WriteLine("Enter command (+ item, - item, or -- to clear)):");

Graphical user interface, application

Description automatically generated

Graphical user interface, text

Description automatically generated with medium confidence

3. Write a method that calculates all prime numbers in given range and returns them as array

of integers

static int[] FindPrimesInRange(startNum, endNum)

{Text

Description automatically generated

}

4. Write a program to read an array of n integers (space separated on a single line) and an

integer k, rotate the array right k times and sum the obtained arrays after each rotation as

shown below.

After r rotations the element at position I goes to position (I + r) % n.

The sum[] array can be calculated by two nested loops: for r = 1 … k; for I = 0 … n-1.

Input Output Comments

3 2 4 -1 3 2 5 6 rotated1[] = -1 3 2 4

2 rotated2[] = 4 -1 3 2

sum[] = 3 2 5 6

1 2 3 4 5 12 10 8 6 9 rotated1[] = 5 1 2 3 4

3 rotated2[] = 4 5 1 2 3

rotated3[] = 3 4 5 1 2

sum[] = 12 10 8 6 9

Graphical user interface, text, application

Description automatically generated

Graphical user interface, text, application

Description automatically generated

5. Write a program that finds the longest sequence of equal elements in an array of integers.

If several longest sequences exist, print the leftmost one.

Input Output

2 1 1 2 3 3 2 2 2 1 2 2 2

1 1 1 2 3 1 3 3 1 1 1

4 4 4 4 4 4 4 4

0 1 1 5 2 2 6 3 3 1 1

Graphical user interface, application

Description automatically generated with medium confidence

7. Write a program that finds the most frequent number in a given sequence of numbers. In

case of multiple numbers with the same maximal frequency, print the leftmost of them

Input Output

4 1 1 4 2 3 4 4 1 2 4 9 3 The number 4 is the most frequent (occurs 5 times)

7 7 7 0 2 2 2 0 10 10 10 The numbers 2, 7 and 10 have the same maximal

frequence (each occurs 3 times). The leftmost of them is 7.

Graphical user interface, text, application, email

Description automatically generated

Practice Strings

1. Write a program that reads a string from the console, reverses its letters and prints the

result back at the console.

Graphical user interface, text, application

Description automatically generated

Write in two ways

Convert the string to char array, reverse it, then convert it to string again

Print the letters of the string in back direction (from the last to the first) in a for-loop

Graphical user interface, text, application

Description automatically generated

2. Write a program that reverses the words in a given sentence without changing the

punctuation and spaces

Use the following separators between the words: . , : ; = ( ) & [ ] " ' \ / ! ? (space).

All other characters are considered part of words, e.g. C++, a+b, and a77 are

considered valid words.

The sentences always start by word and end by separator.

C# is not C++, and PHP is not Delphi!

Delphi not is PHP, and C++ not is C#!

The quick brown fox jumps over the lazy dog /Yes! Really!!!/.

Really Yes dog lazy the over jumps fox brown /quick! The!!!/.

3. Write a program that extracts from a given text all palindromes, e.g. “ABBA”, “lamal”, “exe”

and prints them on the console on a single line, separated by comma and space.Print all

unique palindromes (no duplicates), sorted

Hi,exe? ABBA! Hog fully a string: ExE. Bob

a, ABBA, exe, ExE

4. Write a program that parses an URL given in the following format:

[protocol]://[server]/[resource]

The parsing extracts its parts: protocol, server and resource.

The [server] part is mandatory.

The [protocol] and [resource] parts are optional.

https://www.apple.com/iphone

[protocol] = "https"

[server] = "www.apple.com"

[resource] = "iphone"

ftp://www.example.com/employee

[protocol] = "ftp"

[server] = "www.example.com"

[resource] = "employee"

https://google.com

[protocol] = "https"

[server] = "google.com"

[resource] = ""

www.apple.com

[protocol] = ""

[server] = "www.apple.com"

[resource] = ""

Explore the following Topics

Strings

Arrays

Using the StringBuilder