

Exercise 1. String Library:

(1 point)

- In this exercise we are going to write a program that asks the user to input his first name and last name then join them in one single string (array of characters). We will use the functions `strcpy` and `strcat`, to copy the string into another location of the memory then concatenate the two strings and store them into the third string. Then print the user's full name.
- **Step1:** Include `string.h` in your code.
- Note that you can use the next functions:
 - `strcpy(s1, s2)`; copies all of the `s2` characters into `s1`.
 - `strcat(s1, s2)`; appends all of the `s2` characters to the end of `s1`.
 - `strlen(str)`; returns the number of characters in a string without counting '\0'.
- **Step2:** Define a constant variable called `MAX` with the value 50.
- **Step3:** Create two char arrays (FirstName and LastName). Use `MAX` as their size. Then read their values from the user.
- **Step4:** Create a third char array (Full Name) with the size of `Max * 2`. Then copy `FirstName` and `LastName` to it.

Exercise 2. User-defined header files:

(2 point)

Create the header file `IntArray.h` and the source file `IntArray.c` that have the following functions:

- A function called `max`. It will take an array of integers and its size as a parameter. Then returns the index of the maximum integer. If there can't be a maximum number, it should return -1. The methods signature should look like this:
`int max(int arr[], int size)`
- A function called `secondMax`. It will take an array of integers and its size as a parameter. Then returns the index of the second maximum integer. If there can't be a second maximum number, it should return -1. The methods signature should look like this:
`int secondMax(int arr[], int size)`
- A function called `average`. It will take an array of integers and its size as a parameter. Then returns the average of the numbers. If there were no elements in the array, it should return zero. The methods signature should look like this:
`float average(int arr[], int size)`
- Write a main function that should do the following:
 - Create an array of integers with the size of 10.
 - Read integer numbers from the user until 0 (Zero) is typed or reaches 10.
 - Zero should not be stored in the array.
 - And then show the following:
 1. The maximum number and its index in the array.
 2. The second maximum number and its index in the array.
 3. The average of the numbers in the array. Show 2 digits after the floating point.

Exercise 3. Array search for an element

Write a program with a function that searches for an element in an array of type integer and returns its index.

Write a main function to test your work. (1 point)

Exercise 4.

Write a program with a function that counts all the even and odd numbers present in an array.

Write a main function to test your work. (1 point)

Lab assignment:

(5 points)

Write a C program assignment.c to rearrange an array in reverse order without using a second array.

Write a main function to test your work.

Bonus exercise:

(5 points)

Write a program to arrange the numbers in an array in such a way that the array will have the odd numbers followed by the even numbers.

Write a main function to test your work.