Introduction to Programming

# Workshop 4: Arrays

In this workshop you will practice the use of arrays.

Follow the instructions given to complete small programming tasks.

## 4.1 Task 1: Creating and Looping Through an Array

```
The value in the index number 3 is: Shanghai
The fourth item in the int array is: 31
In the double array there are 3 items
Integer array contents:
5
7
32
31
8
Double array contents last to first:
67.44
-13.55
12.4
New string array: empty,empty,empty,empty
```

Create a program with the following arrays:

1. an integer array with five items: 5, 7, 32, 31 and 8.
2. a double array with three items: 12.4, -13.55 and 67.44,
3. a string array with four items: “Helsinki”, “Lissabon”, “New York” and “Shanghai”.

Then print out the following:

- “The value in the index number 3 is: “ and the value from the string array.
- “The fourth item in the int array is: “ and the value from the int array.
- “In the double array there are xx items” where xx is the size of the array.
- The whole content of the integer array with a loop.
- The whole content of the double array from the last item to the first.
- Lastly, in a loop go through the string array and set all the values to be “empty” and print it out as a comma separated string.

## 4.2 Task 2: Reverse

```
This program reads numbers from the keyboard.
After receiving a zero, it prints the numbers
in reverse order. Please, start entering numbers.
The program will stop when you enter a zero.

0 Enter a number: 1
1 Enter a number: 2
2 Enter a number: 3
3 Enter a number: 4
4 Enter a number: 5
5 Enter a number: 6
6 Enter a number: 0

Reverse order:  0 6 5 4 3 2 1
```

Create a program that keeps asking the user to input numbers. These numbers are stored in an array. Keep asking till zero is entered. After that the numbers are printed out in a reverse order. Don’t use array methods for this but only simple loops.

## 4.3 Task 3: Average

```
This program calculates the mean value of
the numbers you enter from the keyboard.
The program stops when you enter a letter.

Enter a number: 1
Enter a number: 2
Enter a number: 1
Enter a number: 2
Enter a number: q

The average is: 1.5
```

Create a program that asks user for number and calculates the average for them. Numbers will be asked till the user enters a letter.

*Hint! You can check whether a value is numeric with* `isNaN()`.

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## 4.4 Task 4: Linear Search

```
The number you'd like to search: 55
55 was found in index 0
```

```
The number you'd like to search: 123456
123456 was not found
```

Create a program that finds specific items in an array.

1. Create an array with the following items: 55, 23, 6456, 324, 21, 234, 72, 21
2. Ask the user what they want to search for in the integer array.
3. Loop through the array and compare the values with the input given by the user.
4. If the item is found, print out in which index the value was found.
5. If the item is not found, print out a message saying item was not found.

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## 4.5 Task 5: Smallest and Largest with Random Numbers

1. Create a program with an 100 item array that is initialized with random numbers of range 0-1000.
    - To create random numbers you can use Math.random () function.
2. Find the largest value in the array using a loop and print it out.
3. Find the smallest value in the array using a loop and print it out.

```
Random numbers: 462, 346, 44, 213, 149, 241, 967, 671, 381, 904, 827, 741, 459, 316, 550, 176, 104, 174, 983, 466, 790, 733, 6
4, 949, 522, 390, 613, 311, 52, 420, 104, 993, 387, 350, 994, 887, 952, 956, 618, 781, 424, 688, 874, 783, 551, 54, 95, 205, 1
, 50, 192, 535, 723, 284, 133, 865, 397, 334, 69, 242, 934, 775, 613, 110, 334, 142, 973, 877, 17, 98, 582, 963, 370, 241, 298
3, 275, 559, 935, 464, 89, 993,
Largest number is 994
Smallest number is 9
```

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