

CSC240_Lab03: "1D Arrays"

Points: 100 points.

Objective:

- To design and implement static methods to process 1D Arrays.

Instructions:

- Be sure to document your code (add comments on top of your java file).
- In the comments add your name, date, course, homework number, and statement of problem.
- Once you are done, upload your solution through Blackboard.
- No need for input validation.
- The return type for every method is different. Be careful.

Project01: [60 points]

Write a project called `ArraysStaticMethodsDemo`. It has the following two classes:

Part1 [60 points]: (Implementation class) `ArraysStaticMethods`

- which has four `static` methods:
1. **[15 points] `readInputs`**: it reads the array size from the user, and then it reads a corresponding entries to that size. E.g., if a user enters 10 for the array size, then we declare an array of 10 and then read 10 entries and store them in the array. (Remember the Run-time Array Length!).
 2. **[15 points] `swap`**: it finds the *position* (or *index*) of the maximum and minimum values in the array, and *swap* them (move the biggest element to the position of the smallest, and move the smallest element to the position of the biggest).
 3. **[15 points] `even`**: Display "true" if there is an even number of even numbers among these 10. Otherwise, display "false".
 4. **[15 points] `displayOutputs`**: it displays the array elements.

Part2 [10 points]: (Testing class) `ArraysStaticMethodsDemo`

- Make sure you display clear out put messages to the user.
- Since we are calling static methods, no need to create an object of class `ArraysStaticMethods`.

What length is the array? 4

Enter an integer: 11

Enter an integer: 22

Enter an integer: 33

Enter an integer: 44

The array before: [11, 22, 33, 44]

Does the array contain an even number of evens? true

The array after: [44, 22, 33, 11]

Project02: [30 points]

[30 points] (`Temperature.java`) Write a program that reads in an integer N, and randomly generates N temperature values for the past N days. Each temperature should be an integer in the range 60-80. It should then display the average of temperatures over the N days and how many days were above-average in temperature.

- Hint: need two loops, one to calculate the average and the second one to count how many days above such an average.
- Sample run:

```
Enter a number: 7
I will find the average of 7 random degrees in the range 60-80

Random degrees: [71.0, 80.0, 71.0, 78.0, 63.0, 75.0, 66.0]
Average temperature: 72.0
Degree(s) above average: 3
```