

 yoavg / ioop2017

Assignment 1

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Java for C programmers

In this assignment you will write a few simple java programs in a procedural (**not** Object Oriented) style. The purpose of this assignment is to refresh your memory on the *Intro to CS* course material, and get you up to speed with the basic java syntax.

Task 1: Factorial

Write a program for calculating the factorial function. Your code should reside in a file named `Factorial.java`. The program will read a number `n` from the commandline, and will then calculate `n!` twice, once using a recursive definition, and once using an iterative procedure, and print out the result.

For example, invocation of your program should look like this:

```
> java Factorial 5
recursive: 120
iterative: 120
```

(lines starting with `>` are what you write to the shell, other lines are expected output).

Your `main(String[] args)` method will read the input number from the `args` array and convert it from a string to an integer. It will then call the two methods:

```
public static long factorialIter(long n);
public static long factorialRecursive(long n);
```

and print the results.

Note: you can convert a string to an integer using the following code:

```
int n = Integer.parseInt("123");
```

Task 2: Arrays

Write a program called `DescribeNumbers` that gets a list of numbers in the commandline, and prints their minimum, maximum, and average values.

```
> java DescribeNumbers 12 2 3 -9 8
min: -9
max: 12
avg: 3.2
```

Your program must define and use (at least) the following functions:

```
public static int[] stringsToInts(String[] numbers);
public static int min(int[] numbers);
public static int max(int[] numbers);
public static float avg(int[] numbers);
```


Task 3: Sorting

Write a program called `Sort` that will take a sorting order followed by a list of numbers from the commandline and print out the sorted list of numbers:

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```
> java Sort asc 12 2 3 -9 8
-9 2 3 8 12
> java Sort desc 12 2 3 -9 8
12 8 3 2 -9
```

here, `asc` means ascending order and `desc` means descending order.

Note: string comparison is performed using the the `.equals()` method of `String`:

```
String s = "hello";
if (s.equals("hello")) {
    // do something
}
if (s.equals("goodbye")) {
    // do something else
}
```

For sorting, you can use the [Bubble Sort](#) algorithm.

Submission Instructions

Submit through the [Submission System](#)

Please follow the general [Submission Instructions](#) for the course.

Make sure your code follows the [CodingStyle](#).

You may ask questions on [piazza](#)