

CS2230 Computer Science II: Data Structures

Homework 1

Intro to Java

Due January 26, 2017, 11:59pm

Goals for this assignment

- Recognize Java syntax
- Use Java to solve some problems

Submission Checklist

You should submit the three .java files specified in this document. Upload them on ICON under Assignments > Homework 1. Physical paper copies are not accepted.

- Does BaseCheck.java run as required?
- Does ZeroFirst.java run as required?
- Does MaxBoth.java run as required?
- For each program, the only changes you made were (1) filling in code in the required method and (2) optionally adding more test cases.
- Did you submit all of those files to ICON?
- **Now, download the files you just submitted to make certain they are the right versions!**

Problem 1 (10 points)

A base-paired DNA sequence is one where A's line up with T's and G's line up with C's. For example:

base-paired DNA sequence

ATCGAT

TAGCTA

If A is not paired with T, T with A, G with C, or C with G, then the sequence is not base-paired. For example:

not a base-paired DNA sequence

ATCGAT

TAGCAA

not a base-paired DNA sequence

ATCGAT

TATCTA

A base-paired sequence also needs both sides to have the same length. For example,

not a base-paired DNA sequence

ATCG

TAGCTA

Write a method `base_check` that takes two arrays of characters as arguments and returns true if and only if the DNA sequence represented by the arrays is base-paired.

Implement your solution in the file we have provided: `BaseCheck.java`. Your program should run and print only "Tests pass" in the console. It is your responsibility to make sure the program runs properly either in NetBeans OR with the following command line commands.

```
javac BaseCheck.java
java BaseCheck
```

Problem 2 (10 points)

Write a method `zero_first` that takes an array as an argument and changes the array so that it has all its zeroes at the beginning.

```
[-1,-2,-2,4] => [-1,-2,-2,-4]
[4,3,2,1,0] => [0,4,3,2,1]
[0, 5, 0, -1, 10, 11] => [0,0,5,-1,10,11]
[-4, 5, -6, 7, 0, 4, 3, 0, 0] => [0,0,0,-4,5,-6,7,4,3]
[0,0,1] => [0,0,1]
```

Implement your solution in the file we have provided: `ZeroFirst.java`. Your program should run and print only "Tests pass" in the console. It is your responsibility to make sure the program runs properly either in NetBeans OR with the following command line commands.

```
javac ZeroFirst.java
java ZeroFirst
```

Problem 3 (10 points)

Write a method `max_both` that takes two arrays of positive integers as arguments and returns the maximum integer found in both arrays. If not duplicates are found it returns -1. For example:

[2,4,6,8,10,12,14]
[7,7,5,4] => 4

[2,4,6,8]
[3,5,7] => -1

[7,6,22,4,4]
[4,5,5,25,6] => 6

Implement your solution in the file we have provided: `MaxBoth.java`. Your program should run and print only "Tests pass" in the console. It is your responsibility to make sure the program runs properly either in NetBeans OR with the following command line commands.

```
javac MaxBoth.java  
java MaxBoth
```

Helpful Tips

- What do I do if my program prints the following?

FAILED TEST 1

This message means that your method didn't return the correct answer for the test 1a. You must debug your program. Go look at TEST 1 in the `main()` method and make sure you understand the test case. Try printing out the values of variables at different parts of the program to see if it is what you expected. Print statements look like `System.out.println(...)`