CS2230 Computer Science II: Data Structures
Homework 1
Intro to Java

Due August 31, 2017, 11:59pm

Goals for this assignment

- Recognize Java syntax
- Use Java to solve some problems

Submission Checklist

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

- Does AbsMax.java run as required?
- Does TwoSum.java run as required?
- Does MaxCol.java run as required?
- Did you submit all of those files to ICON?

Problem 1 (10 points)

Write a method `abs_max` that takes an array as an argument and returns the integer with the maximum absolute value. In the case of ties, take the integer that appears earliest in the array. Here are some example cases.

[1,2,5,3,4] => 5
[-1, 0, 1] => -1
[1, 0, -1] => 1
[3, -1, 5, -6] => -6

Implement your solution in the file we have provided: `AbsMax.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 AbsMax.java
java AbsMax
```

Problem 2 (10 points)

Write a method two_sum that takes an array as an argument and returns true if the array contains at least one pair of *different* elements that add up to 0 and returns false otherwise. Here are some example cases.

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

Implement your solution in the file we have provided: TwoSum.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 TwoSum.java
java TwoSum
```

Problem 3 (10 points)

Write a method max_col that takes a 2-dimensional array as an argument and returns the index of the *column* that has the maximum sum. For a 2-d array of ints, consider the *row* to be the first index and the *column* to be the second index.

You may assume all rows of the 2-d array passed to max_col are of the same length. This fact should simplify the solution.

HINT: In Java, 2-d arrays are really an array of arrays. Therefore, for a 2-d array X, you can get the length of a row k using X[k].length

Implement your solution in the file we have provided: MaxCol.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 MaxCol.java
java MaxCol
```

Helpful Tips

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

```
FAILED TEST 1a
```

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 1a in the `main()` method and make sure you understand the test case. Try adding print statements (`System.out.println(...)`) to different parts of your code to see what values variables have at different times to see if it is what you expected.