Problem set 0

Review of AP CS Skills

Learning to Write JUnit Tests

JUnit 5 Docs:

https://junit.org/junit5/docs/current/user-guide/

Problem Set 0

Grading Standards (Homework Category)

1. I can work with a partner to come up with a list of test cases for each of the problems detailed in this assignment. (10 pts) due Friday Sept 13th 11:59pm
2. I can write test cases that correctly execute each of the test cases in my plan. (10 pts) due Monday Sept 16th 11:59pm
3. I can code accurate solutions to each of the problems detailed in this assignment. (10 pts) due Monday Sept 16th 11:59pm

Problem 0 – How Many Duplicates

Introduction

Write test cases to thoroughly test a method called `countDuplicates` that returns all duplicate characters in a string and their counts, one per line. Your test cases should consider general tests and corner cases.

Program Input

A single String of any length.

Example Input

```
"Programming"
```

Program Output

Each line of the returned String should contain the letter that is found to be a duplicate, a colon, and the count.

Example Output

```
r:2
g:2
m:2
```

Problem 1 – Alternating Array

Introduction

Write test cases to thoroughly test a method called `alternatingArray` that, given an array of positive and negative numbers, arranges them in an alternate fashion such that every positive number is followed by negative and vice-versa maintaining the order of appearance. The number of positive and negative numbers need not be equal. If there are more positive numbers they appear at the end of the array. If there are more negative numbers, they too appear in the end of the array. Your test cases should consider general tests and corner cases.

Program Input

An array of any length that contains both positive and negative integers.

Example Input

`{1, 2, 3, -4, -5, -6}`

Program Output

An array where every positive number is followed by a negative number and vice-versa.

Example Output

`{1, -4, 2, -5, 3, -6}`

Problem Set 0

Problem 2 – Into the Matrix

Introduction

Write test cases to thoroughly test a method called `hasSum` that, given a 2D integer array, `mat`, and an integer, `sum`, determines if two elements in mat can be added together to form sum.

Program Input

A 2D integer array and an integer value for k.

Example Input

```
mat = { {1,   7, -6, 5},
        {-8,  6, 7, -2},
        {10, -15, 3, 2},
        {-5, 2, 0, 9 }}
sum = 7
```

Program Output

Your program should return a boolean indicating if two elements from mat total to sum.

Example Output

```
true
```

Problem Set 0

Problem 3 – No Plurals Please

Introduction

Write test cases to thoroughly test a method called `removePlurals` that accepts an `ArrayList` of strings and removes every word in the list ending with an "s", case-insensitively. This program should modify the `ArrayList` in-place instead of returning a new modified list.

Program Input

An ArrayList of strings.

Example Input

```
{"Hello", "cats", "dogs", "rain"}
```

Program Output

There is no return value, but the original ArrayList should be modified.

Example Output

```
{"Hello", "rain"}
```