Problem Set #1

Starters

1. Write a method to take in two numbers and return the sum. [1]
2. Write a method that takes in a string and returns a mutated version of the string, where the first 2 characters are moved to the end. E.g. “Hello” => “lloHe”. [2]
3. Write a method that takes in a number and returns true if the number is even. [2]
4. Write a method that takes in a number returns its remainder when divided by 3. [2]

Using Java’s Built-in Data Structures

ArrayLists of Integers

5. Write a method to take an ArrayList of integers, and which returns the sum of the integers. [5]
6. Write a method that takes in an integer parameter n and returns the first n Fibonacci numbers in the form of an ArrayList. [10]
7. Write a method that takes in an integer parameter n and returns all the factors of n. [10]
8. Write a method to take an ArrayList of integers, and which returns the mean of the integers. [5]
9. Write a method that takes in a string and returns an ArrayList containing each of individual characters in that string. E.g. “Hello” => [“H”, “e”, “l” ,”l”, “o”]. [5]

Writing Your Own Data Structures

Object-Oriented Programming

10. Write a class called *Point*, which has two integer properties *x* and *y*. [3]

Arrays

11. Write a method that takes in an array of integers and returns the sum of all the items within the array. [3]
12. Write a method that takes in an array of integers and an integer to find, and returns true or false depending on whether the array contains that integer. [3]
13. Write a method that takes in an array of integers and returns a new array which each item doubled. [3]

ArrayList

14. Write a simple implementation of an ArrayList for just integers called ArrayListSimple, it should implement get, add and size. [20]
15. Using generics, write a custom implementation of an ArrayList for all types. [20]
16. Using generics, write an implementation of a LinkedList, using a private class called Node. [20]
17. Using generics, write a custom implementation of a MaxHeap. [20]