

# Programming Assignment Two

Due Monday September 27

This programming assignment is tedious. What I want you get out of this:

- Be comfortable with inputting data from command line.
- Be able to work with strings: to get data from them, to parse string data.
- Know how to format floating point numbers.
- Learn to have more patience in programming

1. (Basically Exercise P3.4) Write a program that prompts the user for two integers and the prints

- The sum
- The difference
- The product
- The average
- The distance (absolute value of difference)
- The maximum (the larger of the two)
- The minimum (the smaller of the two)

Implement a class

```
public class Pair
```

```
{
```

```
/**
```

```
Constructs a pair.
```

```
  @param aFirst the first value of the pair
```

```
  @param aSecond the second value of the pair
```

```
*/
```

```
public Pair (double aFirst, double aSecond) { .....}
```

```
/**
```

```
Computes the sum of the values of this pair.
```

```
  @return the sum of the first and second values
```

```
*/
```

```
public double getSum( ) { .... }
```

```
.....
```

```
}
```

Then implement a class **PairTest** that reads in two numbers using a `BufferedReader`, constructs a `Pair` objects, invokes its methods, and prints the results.

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Here are requirements on the inputs and outs

- The input prompts take either no, one or two or integers: integers are separated by spaces. Your program should handle all the three cases

The first prompts line reads like the following:

**Please enter your integers:**

if no integers are entered, the next prompt line reads like

**Please enter at least one integer:**

if only one integer is entered, the next prompt lines reads like

**Please enter one or more integers:**

if more than one integers are entered, only the first will be take and the rest will be discarded.

If two or more integers are entered, only the first two will be taken and the rest will be discarded.

- The outputs should read like the like the following (please DO NOT hard code these numbers):

The sum of 34 and 27 is 54.

The difference of 34 and 27 is 7.

Similar outputs for product, average, distance, maximum and minimum.

Here are data you will be using:

(No data) null line

2

3

1 5

1 9999

-1 3333

34 34

1000 2000 45 -90

Note spaces are allowed before and after numbers

2. (Exercise P3.13) Implement a class **QuadraticEquations** whose constructor receives the coefficients a, b, c of the quadratic equation  $ax^2 + bx + c = 0$ . Supply methods **getSolution1** and **getSolution2** that get the solutions, using the quadratic formula. Write a test class **QuadraticEquationTest** that prompts the user for values of a, b and b, constructs a QuadraticEquation object, and prints the two solution.

Here are the requirements on the input and output.

- The output can print real or complex solutions. For example, print a complex number  $x + yi$  as  $x+y*\text{sqrt}(-1)$  and  $x - yi$  as  $x-y*\text{sqrt}(-1)$ . Print each floating number two places after the decimal points:

The output should looks like the following:

Solutions to  $1*x*x + -11*x + 28$  are 4.00 and 8.00

Solutions to  $1*x*x + 0*x + -1$  are 1.00  $\text{sqrt}(-1)$  and  $-1.00\text{sqrt}(-1)$ .

Solutions to  $2*x*x + 8*x + 8$  are  $-4.00$  and  $-4.00$

Solutions to  $1*x*x+ -4*x +1$  are  $2.00+1.73 \text{sqrt}(-1)$  and  $2.00-1.73 \text{sqrt}(-1)$

- The input line read the three coefficients a, b and c in order (you can assume a is not zero to make your life easier)

Here are the data you will be using:

1 2 1

2 4 5

4 10 3