



## Lab Assignment 3

In this assignment you are to write a program to solve the following problem. As with all lab assignments, remember the following submission steps:

- Make sure your code passes at least all the provided JUnit tests
- Save, commit, and push all code changes
- Confirm the latest code is visible via the “Files” section of your repository website
- Confirm that the repository is private, and that the instructor has Developer access
- Note: you do **NOT** need to document your code

### Problem a (LA3a.java)

Write a program to calculate the result of one of three operations (minimum, L1 norm, L2 norm) on a vector of three numbers. To begin, have the user input three numbers at the keyboard (e.g. -1 2 3). Then, ask the user to type in an operation (valid operations are “min”, “l1”, or “l2”; all letters are lowercase). Assuming the user types a valid operation, your program should compute and output to the screen the result based upon the three numbers; otherwise output an error.

For “min”, the result is the minimum of the three numbers (i.e. -1). For “l1”, the result is the sum of the absolute values of the three numbers (i.e.  $| -1 | + | 2 | + | 3 | = 1 + 2 + 3 = 6$ ). For “l2”, the result is the square root of the sum of the squares (i.e.  $\sqrt{(-1)^2 + (2)^2 + (3)^2} = \sqrt{1 + 4 + 9} = \sqrt{14} = 3.74$ ). Example runs:

```
Enter three numbers: -1 2 3
Enter operation: min
min(-1.00, 2.00, 3.00) = -1.00
```

```
Enter three numbers: -1 2 3
Enter operation: l1
l1(-1.00, 2.00, 3.00) = 6.00
```

```
Enter three numbers: -1 2 3
Enter operation: l2
l2(-1.00, 2.00, 3.00) = 3.74
```

```
Enter three numbers: -1 2 3
Enter operation: foobar
Invalid operation!
```

```
Enter three numbers: -1 2 3
Enter operation: MIN
Invalid operation!
```

Note that all values should be output with two decimal places (rounding where necessary).