

Student: Eduardo de Oliveira Castro  
Blazer ID: edc  
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Report for Lab #04

## The problem and the objectives

The objective for this lab was basically to create a software that creates a Matrix and is capable of performing sums and multiplications with it.

## The process, code and results

I created the software following Test-Drive Development, “baby-steps” procedures and the demands from the lab guide. First of all I created the read function, at the beginning it was a little bit confusing because I didn’t figure out how to work with the matrixes at first but after some help and tips from the TA’s I got it. I also have a variable for checking if the matrix was initialized for preventing someone to call one of the other methods with an empty matrix.

All the other methods were pretty trivial and basic so there is not much to comment about it. The Plus method was also relatively easy, the challenge from this lab, at least for me, was all related to the times method. I took a long time to figure out how to work with the three for loops.

Exceptions are call every time a function is called when it was not supposed to and when the parameters are out of the range. All the code also follows some good practices and design patterns and there is a JUnit file on the project that tests most of the methods from the class.

The final print from the main class is the following showing all the basic operations been executed:

The screenshot shows the Eclipse IDE with a Java project named 'lab03'. The file 'Matrix.java' is open, and the console shows the output of the program. The program defines two matrices, 'a' and 'b', and calculates their product 'c'.

```

classmate: MainRun [Java Application] Library [Java Virtual Machine (JVM) 8.0_80] Contents/Tools/bin [Java IDE, 2018, 10:00:22 PM]
Main:
[ 1.0 2.0 3.0 4.0 ]
[ 5.0 6.0 7.0 8.0 ]

x

[ 1.0 2.0 3.0 4.0 ]
[ 5.0 6.0 7.0 8.0 ]

x

[ 2.0 4.0 6.0 8.0 ]
[ 10.0 12.0 14.0 16.0 ]

Multiplication:
[ 1.0 2.0 3.0 ]
[ 4.0 5.0 6.0 ]

x

[ 7.0 8.0 ]
[ 9.0 10.0 ]
[ 11.0 12.0 ]

x

[ 10.0 14.0 ]
[ 130.0 156.0 ]

The last matrix has 2 columns and 2 rows.
The original value from the position [0][0] is 10.0 and now we are changing it to the value 5.0.
The original value from the position [0][0] is 5.0.
  
```