

Lab Title (Example: A Performance Comparison of Two Matrix Inversion Algorithms)

Author's name

Date

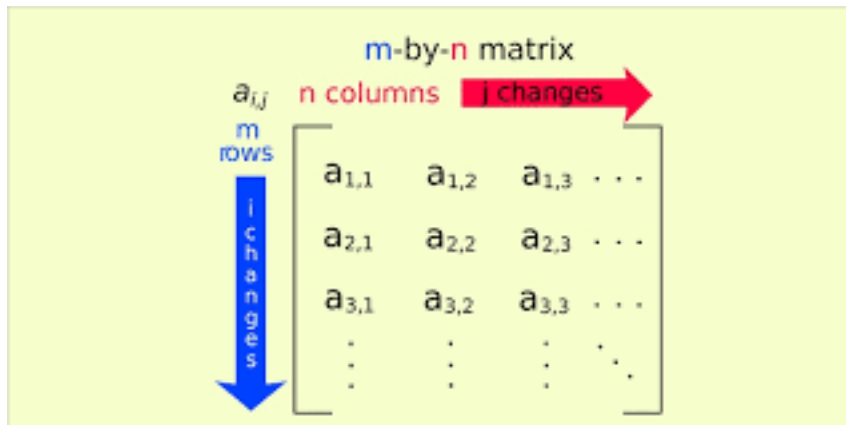


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(**NOTE:** For this example template, we assume the lab involved investigating two techniques for inverting matrices, and comparing their performance)

1. Introduction

In this section describe the purpose of the lab, what was investigated, why it is interesting at a high level, etc. This section usually ranges from 1 – 3 paragraphs. (**Example:** Reasons matrix inversion is of interest include: it is essential in many signal processing algorithms, there are issues related to the accuracy with which a matrix can be inverted, different inversion algorithms have different speeds, etc.).

2. Background

You may assume that the reader of your report has the same technical background as yourself. The goal of this section, when present, is not to regurgitate basic material a skilled reader will already know. However, there may be some explanatory material that you would like to include to assist your reader. Or, you might want to point your reader to a particular reference. If so, put such information in this section. (**Example:** for a lab on matrix inversion you might remind the reader what a matrix inverse is, mention that there are several different algorithms for inverting matrices, list some of them, mention the algorithm you will be implementing, and point the reader to a general reference on the implementation approach you followed).

3. Part I: Inverting Matrices of Different Sizes

Describe the goal of this part of the lab (**Example:** testing the speed of your algorithm on matrices of different size, quantifying the algorithm's numerical accuracy, determining how the speed of the algorithm depends on the size of the matrix to be inverted, etc.).

3.1. Inverting 3x3 matrices (this is task/assignment 1 for Part I of the lab)

Describe what you did, present your results for this task, and discuss them. What answers were obtained? Make sure the results are clearly labeled so they can be easily cross-referenced when discussing them. What is the significance of the results? Why do they matter? What do they show? What was learned? This section is as long as it needs to be to adequately cover the task. Don't skimp on this section.

3.2. Inverting 5x5 matrices (this is task/assignment 2 for Part I of the lab)

Same as above...

4. Part II: Linear Transformations of the Plane

Describe the goal of this part of the lab (**Example:** to visualize the effects of an arbitrary 2-D linear mapping—a matrix multiply—when applied to a 2-D image)

4.1. Rotation matrices (this is task/assignment 1 for Part II of the lab)

Describe what you did, present your results for this task, and discuss them. What answers were obtained? Make sure the results are clearly labeled so they can be easily cross-referenced when discussing them. What is the significance of the results? Why do they matter? What do they show? What was learned? This section is as long as it needs to be to adequately cover the task. Don't skimp on this section.

4.2. Scaling matrices (this is task/assignment 2 for Part II of the lab)

Same as above...

5. Conclusion

What high-level conclusions are appropriate for this lab? If you could do the lab over, what might you do differently? What would be worthy of further investigation? (**Example:** for a matrix inversion lab you may be able to conclude that the number of operations required to invert a matrix increases exponentially with its dimension. You might have determined that the closer a matrix is to being singular, the larger the numerical errors in your algorithm. You might realize that you could have architected your code differently to make it easier to manage all the test cases. You might conclude that comparing your algorithm to another matrix inversion algorithm would be beneficial and explain why).

6. Appendix

This section will contain your code. It might contain additional information as well.

6.1. Scripts for Part I

Put the code for Part I here, use subsections as appropriate to make clear which scripts apply to which tasks. Some words about the code's organization and operation can only hope.

6.2. Scripts for Part II

Same as above

6.3. Other

If present, put such material here. this would be lab dependent (**Example:** for the matrix inversion lab, you might include a derivation of interest that is too long to put into the background section)