
ILAB 01: PRINCIPLE COMPONENTS ANALYSIS VISUALIZATION

Revision History

Revision	Date	Author(s)	Description
1.0	Feb 24, 2023	LN Nam	Initial, release first version in English.

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1 Learning Objectives

Principal component analysis (PCA) has been called one of the most valuable results from applied linear algebra. In this assignment, you will learn about this technique and leverage visualization techniques to visualize how it works on a specific datasets.

2 Notes and Constraints

List of constraints when doing this lab:

-  Work without a report will not be graded.
-  Members who do not contribute to the project will not receive points.
-  Reference sources (if any) need to be fully recorded in the report in the References section. Note that it is necessary to distinguish between referencing and plagiarism.
-  Individuals or groups that commit cheating and dishonesty will receive 0 points in the course.
-  Name the assignment category MSSV_ILab01, with MSSV being the student number, compress the entire submission into 1 file before submitting. If the size is > 20MB, upload it to an external storage service such as Google Drive or OneDrive, and then submit the link. Last but not least, please keep the link public for at least 2 years.

3 Problem Statement

With a given dataset that you can choose whatever you want, here are some requirements to complete this assignment:

- Study about PCA: motivation, problem statement, mathematics behind PCA (bonus point), PCA algorithms, numerical demo (bonus point)
- Applying PCA on your choosed dataset.

4 Limitations

You can leverage the support of thirdparty libraries such as scikit-learn to use PCA (max 8 points) or implement from scratch (max 10 points).

5 Evaluation Criteria

Your assignment will be evaluated based on the following criteria:

Criteria	Mark
Studying PCA	45%
Implementation PCA	45%
Overall comprehension of the submitted source code.	10%
Bonus points	10%
Total	110%

6 What to Submit

You must submit:

- ❑ **Docs Folder:** This folder should contain your report files in .doc, .docx, or .pdf formats, with a strong recommendation for .pdf to ensure compatibility and preservation of formatting. Your report should cover several key areas:
 - **Your Information:** Include your group name and student IDs.
 - **Requirement Fulfillment:** Discuss how fully each project requirement has been met.
 - **Study algorithm:** Provide thorough explanations of the algorithms used, include running examples, and offer commentary on the code.
 - **Presentation Style:** Aim for clarity in your report, using illustrations where helpful to convey your points effectively.
- ❑ **Source_Codes Folder:** This directory should house all the source code for your project. It will primarily contain Jupyter notebooks and Python scripts developed by your team. If you have code in languages other than Python, please include clear instructions for its use.

By organizing your submission in this manner, you'll help ensure that your work is clearly presented, easily navigable, and thoroughly documented, reflecting the depth and breadth of your project efforts.