Week 3 Overview

Overview

In this module, you will learn about vector spaces and subspaces and how to compute the four fundamental subspaces for any matrix. You will also learn how to derive the complete solution of a system of linear equations, if it exists. Then, you will learn the concept of linear independence and how to use it to compute the rank of a matrix. Finally, you will understand the concept of basis by combining vector spaces, span of vectors and linear independence.

Learning Objectives

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Upon completion of this module, you will be able to:

1. Compute the four fundamental spaces of a matrix.
2. Derive the complete solution a system of linear equations with multiple unknowns, it it exists.
3. Understand whether a set of vectors is linearly independent.
4. Understand whether a vector is in the span of a set of vectors.
5. Change a vector representation from a basis to another basis.
6. Learn the most popular Python library for data analysis, `Pandas`.

To-Do List

In order to successfully complete Module 3, please complete the following tasks in order:

1. Watch: Lecture Videos in Module 3.
2. Read: Lecture Slides in Module 3.
3. Read: Chapter 3 in Strang's book.
4. Complete the Lab in Module 3.
5. Discuss: Attend our virtual office hours to discuss any concepts we have discussed so far.
6. Complete Homework 3 published on the Assignments page.