2. Preparations for Principal Component Analysis

Objectives

At the end of this series of exercises, you will be able to do the following:

- Review how to compute the **expectation** and **covariance matrix** of a random vector.
- Compute the **empirical mean** and **empirical covariance matrix** of a vector data set.
- Compute the **variance in a given direction** of a random vector.
- Compute the **empirical variance in a given direction** of a vector-valued sample.
- Describe the fundamental properties of **projection matrices** .
- State the **decomposition theorem** for symmetric matrices.

Discussion

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