



Introduction to PyMC3

✓ **Video:** Welcome to Course 3!
46 sec

📖 **Reading:** What can you expect from this course/specialization?
10 min

▶ **Video:** Probabilistic Programming with PyMC3
5 min

📖 **Reading:** Probabilistic Programming Frameworks
30 min

▶ **Video:** An introduction to PyMC3
5 min

▶ **Video:** Inference with PyMC3
4 min

▶ **Video:** Composition of Distributions
1 min

▶ **Video:** HPD, HDI and ROPE
4 min

▶ **Video:** Credible and Confidence Intervals
3 min

📖 **Reading:** Plate Notation
30 min

Inferring Distributions with PyMC3

▶ **Video:** Modeling with a Gaussian Distribution
6 min

▶ **Video:** Posterior Predictive Checks
3 min

▶ **Video:** Robust Models
2 min



Environment Setup for Run

There are various ways to setup and run the Python notebooks. Here are instructions on how to setup your environment.

https://sjster.github.io/introduction_to_computational_statistics/

The What, Why and Whom.

The purpose of this series of courses is to teach the basics of performing inference. This is **not** intended to be a comprehensive course in statistics and probability nor does it cover Frequentist statistics or Hypothesis Significance Testing (NHST). What it does cover is

- The basics of Bayesian probability
- Understanding Bayesian inference and how it works
- The bare-minimum set of tools and a body of knowledge for performing inference in Python, i.e. the PyData stack of NumPy, Pandas and Plot.ly.
- A scalable Python-based framework for performing Bayesian inference

With this goal in mind, the content is divided into the following

- Introduction to Bayesian Statistics
- Introduction to Monte Carlo Methods
- PyMC3 for Bayesian Modeling and Inference

Why Inference?

The purpose of the set of courses is to focus on **Inferential Statistics**.

All the samples in the group that we are interested in learning about are from a single Population. Populations can be described by **parameters** such as the mean and variance of the data. Often, we do not have access to all the data in the population. The metrics of mean and variance computed from the data are called **statistics** of the data.

Descriptive Statistics