

**Bayesian Inference using Stan for Python (PyStan)**

**Course Number:** PYTH-238  
**Duration:** 1 day

**Overview**

[Stan](https://mc-stan.org/) provides a modeling language using cutting-edge algorithms for statistical modeling, data analysis, and predictive analytics. This Bayesian Inference using Stan for Python (PyStan) training teaches attendees how Bayesian methods can be applied to data using Stan through Python.

**Prerequisites**

Participants must have:

* Probability and statistics basic knowledge, including joint distributions and regression
* Python Programming experience

Some experience with Bayesian Inference or Stan is helpful but not required.

**Materials**

All PyStan training attendees receive comprehensive courseware covering all topics in the course.

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**Software Needed on Each Student PC**

* A recent release of R 4.x
* IDE or text editor of your choice (RStudio recommended)

**Objectives**

* Explore Bayesian inference/MCMC (Markov chain Monte Carlo) methods
* Understand how these methods can be applied to data
* Use Python’s interface to Stan, PyStan

**Outline**

* Introduction to Bayesian Inference
  + The main ideas behind Bayesian inference
* Markov Chain Monte Carlo Methods
  + Methods for Bayesian computation
  + Hamiltonian Monte Carlo
* The Stan Language
  + The main components of a Stan program
* Using PyStan
  + The Python interface to Stan
* Examples
  + Linear regression
  + Poisson regression
  + Hierarchical models
* Conclusion