MT2002: Statistical Modeling

Introduction, Course Overview, Policies

Muhammad Almas Khan
muhammad.almas@nu.nu.pk

FAST-NUCES

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Course Outline

What is Statistical Modeling?

- Understanding and analyzing data using statistical methods.
- Building models to represent real-world phenomena.
- Applications in science, engineering, and business.

Why Study This Course?

- **Purpose:**
  - Equip students with skills to analyze and interpret data effectively.
  - Prepare for careers in data science, machine learning, and research.
- **Importance:**
  - Statistical modeling is essential for data-driven decision-making.
  - Bridges the gap between theoretical concepts and real-world applications.

Rules of the Game

- Be on time to class.
- Switch off or silence your phone during class.
- Talk to me, not your friends, during lectures.
- Participate actively and ask questions.
- Respect others' opinions and maintain decorum.
- **Attendance:** Attendance will be recorded at the beginning of the class. Any discrepancies in attendance due to delays in updating at class time will not be accepted or updated later.
- **Discrepancies in Evaluation:** Address any discrepancies in marks within one day of posting on Flex. No changes will be made afterwards.

What Will You Learn?

- Fundamental concepts in statistical modeling.
- Hands-on experience with tools like Python and PyMC.
- Real-world applications of statistical techniques.

Tools You Will Use

- **Python Programming Language:** The primary language for this course.
- **PyMC:** A library for probabilistic programming and Bayesian inference.
- **ArviZ:** A library for exploratory analysis of Bayesian models.
- **Plotting Libraries:** Tools like Matplotlib and Seaborn for data visualization.

Why PyMC?

- **Intuitive and Flexible:** Simplifies Bayesian modeling and inference.
- **Probabilistic Power:** Supports building complex statistical models with ease.
- **Visualization Support:** Integrates seamlessly with ArviZ for insightful visualizations.
- **Real-World Applications:** Widely used in finance, healthcare, and research for uncertainty modeling.

About This Course

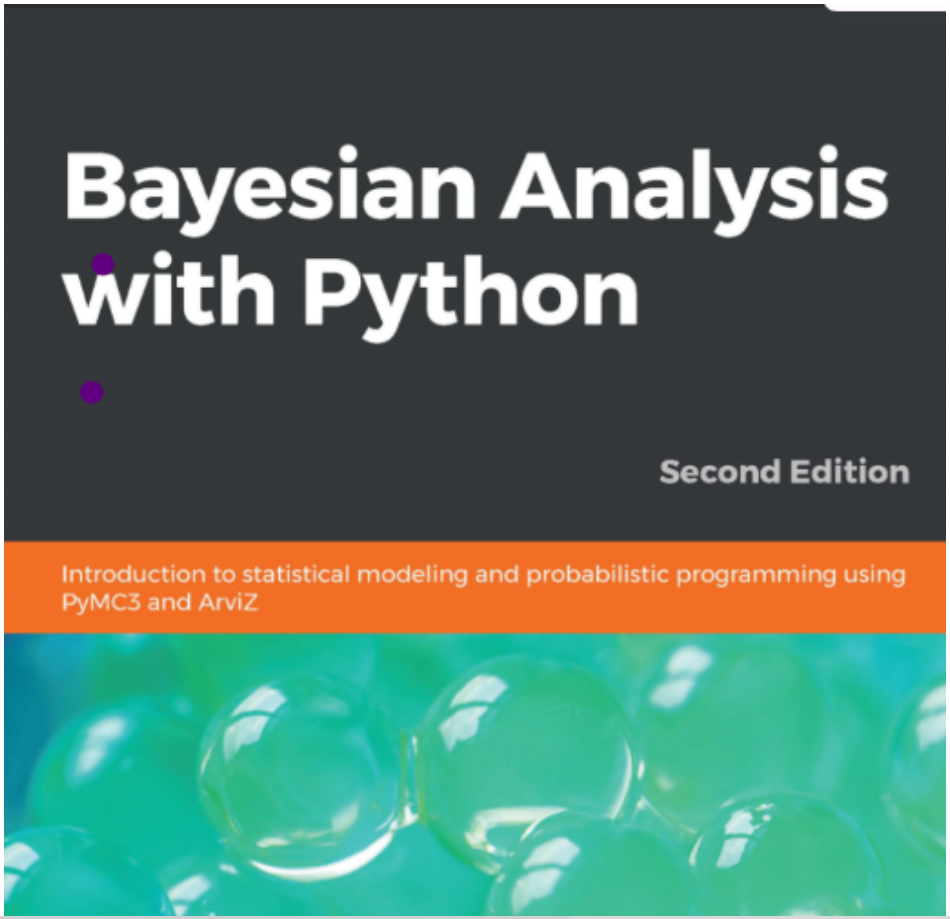
- **What is this course for?**
  - Developing statistical thinking and modeling skills.
- **What will you learn?**
  - Fundamental concepts in statistical modeling, Bayesian inference, and visualization.
- **Our Approach:**
  - Quizzes: 4 to 8.
  - Assignments: 4 to 8.
  - 2 sessional exams and 1 final exam.

How Will You Be Graded?

- Homework Assignments: 10%
- Quizzes: 10%
- Sessional: (15+15=30)%
- Final Exam: 50%

Resources for Success

- Textbook: *Introduction to Statistical Modeling*.
- Python (with libraries for probablistic programming).
- Office Hours: Will share on GCR.



GitHub Repository:

`https://github.com/aloctavo`

Let's Get Started!

Questions? Feel free to ask.

Welcome to MT2002: Statistical Modeling!