Proof-Based Math Readings
Session: Bayesian Statistics
2024 Winter

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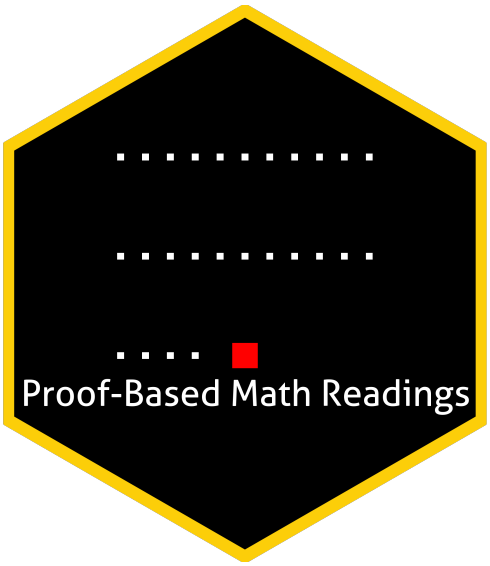

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0 Motivation

- *Proof-Based Math Readings* is a free and independent online reading group where we study mathematics required in economics master's/PhD programs using an intuitive approach.
- This session of the reading group is on *Bayesian Statistics*.

1 Prerequisites

- CGPA: 3.00/4.00.
- Proof and Statistics resources below are the prerequisites for this session.
- Please use the Application Form to join our reading group.
- Applicants are informed about their application results within a week via email.

2 Format

- This session takes 12 weeks.
- We discuss the topics/exercises that we struggle with at Proof-Based Math Readings [Discord].
- We do not have face-to-face/online meetings due to the size of the group.
- Members are expected to read the chapters, and watch the chapter videos from the book's playlist.

3 Resources

3.1 Main Book and Main Book's Playlist

Bayesian Econometrics - Gary Koop (2003) is our main book for this session because it is well-written and well-structured. Gary Koop's playlist is our main playlist because his narrative is just great.

- Bayesian Econometrics - Gary Koop (2003)
- Bayesian Econometrics - Gary Koop (2003, Errata)
- Bayesian Econometrics - Gary Koop (2003, Playlist)

3.2 Supplementary

3.2.1 Bayesian Statistics

- Bayes Rules! - Alicia A. Johnson, Miles Q. Ott, Mine Dogucu (2021)
- Bayesian Statistics: A Comprehensive Course - Ben Lambert (2014)
- A Student's Guide to Bayesian Statistics - Ben Lambert (2020)
- Bayesian Data Analysis - A. Gelman, J. Carlin, H. Stern, D. Dunson, A. Vehtari, D. Rubin (3rd Ed., 2022)
- Bayesian Data Analysis - A. Gelman, J. Carlin, H. Stern, D. Dunson, A. Vehtari, D. Rubin (3rd Ed., 2022, Playlist)
- Explaining the Gibbs Sampler - George Casella, Edward I. George (1992)
- Understanding the Metropolis-Hastings Algorithm (Siddhartha Chib, Edward Greenberg, 1995)

3.2.2 Proof

- Book of Proof - Richard Hammack (3.3 Edition, 2022)
- Book of Proof - Richard Hammack (3.3 Edition, 2022, Playlist by Jeremy Teitelbaum)
- Book of Proof - Richard Hammack (3.3 Edition, 2022, Playlist by Michael Penn)

3.2.3 Statistics

- Introduction to Probability - Dimitri P. Bertsekas, John N. Tsitsiklis (2nd Edition, 2008, Summary Material)
- Introduction to Probability - Dimitri P. Bertsekas, John N. Tsitsiklis (2nd Edition, 2008, Playlist)
- Introduction to Probability - Dimitri P. Bertsekas, John N. Tsitsiklis (2nd Edition, 2008, Solutions & Errata)

4 Reading Schedule

- **BE** is the abbreviation of **Bayesian Econometrics - Gary Koop (2003)**.

BE **Week 01**

Appendix A: Introduction to Matrix Algebra
Appendix B: Introduction to Probability and Statistics
1: An Overview of Bayesian Econometrics

BE **Week 02**

2: The Normal Linear Regression Model with Natural Conjugate Prior and a Single Explanatory Variable

BE **Week 03-04**

3: The Normal Linear Regression Model with Natural Conjugate Prior and Many Explanatory Variables

BE **Week 05-06**

4: The Normal Linear Regression Model with Other Priors

BE **Week 07-08**

5: The Nonlinear Regression Model

BE **Week 09-10**

6: The Linear Regression Model with General Error Covariance Matrix

BE **Week 11-12**

7: The Linear Regression Model with Panel Data

5 Further Readings (Optional)

Bayesian Econometric Methods - Joshua Chan, Gary Koop, Dale Poirier, Justin Tobias (2nd Edition, 2019)
Bayesian Econometric Methods - Joshua Chan, Gary Koop, Dale Poirier, Justin Tobias (2nd Edition, 2019, Errata)