**Bayesian Proposal of final project**

As you embark on drafting your first final project, please ensure that your project proposal encompasses the following essential components:

**1. Topic of Interest:**  
   Clearly define the subject matter you wish to explore in your final project. Choose a topic that aligns with your interests and the course material. This topic may change over time, if needed.

**2. Data Source:**  
   Specify the intended data source for your project. If the data is not yet available, outline your plans for obtaining it. This transparency will help in gauging the feasibility of your project.

**3. Introduction (Motivation):**  
   Provide an introduction that articulates the motivation behind your choice of topic. Explain why this particular subject is interesting for you and its relevance to the course material (the Bayesian part).

**4. Goals:**  
   Clearly outline your project goals. While ambition is commendable, I recommend setting realistic and achievable objectives. This will allow for thorough exploration and demonstration of your understanding of the course material.

**5. Project Purpose:**  
   Remember, the primary purpose of this project is to showcase your grasp of the class material. Although it's not a formal thesis or extensive project \*we don't have time for that), you are encouraged to structure it in a manner that resembles one. Consider this project as a foundation that you may build upon in future endeavors.

**6. Clarification and Questions:**  
   If you have any questions or need clarification on the project requirements, do not hesitate to reach out. I am here to assist you throughout this process.

Best of luck with your project, and I look forward to reviewing your proposals.

**Final project document**

**General description**

You need to show what you have learned in this class by performing a Bayesian statistical analysis of a data set of your choice, in an area of professional interest to you. You may use a journal article that has been analyzed using frequentist methods or even Bayesian methods and contrast them with your own results (replicating the analysis is OK).

**Final Project Outline**

• Describe the biological/environmental/social/other background. What research questions are you trying to answer/resolve? What hypotheses are generated?

• Translation to a Bayesian model. How is the problem situation translated into a Bayesian statistical model? To the extent possible, provide the complete model (likelihood, priors, hyperpriors) and discuss why each was used. Try to focus on the statistical part rather than in the specialized content of your area.

• You can use your own data, or you can try to replicate an article results (from a Bayesian perspective), please specify and discuss implications of:

* chain length, number of chains (show they are properly mixed)
* How long does it take to run?
* Precision and quality of results (Rhat and n-eff, std dev)
* Your own conclusions and interpretation (very important!).

**Final Product**

Minimally, I want the following:

           • In class or zoom presentation as scheduled under "Course content NEW"

* A writeup of the above resembling to a possible extent a format suitable for a publication in a Journal article inlcuding graphs. I’m not asking you to produce a journal quality article as we don’t have enough time for it. I recommend not getting too ambitious in your analysis (reasonable ambitious should be OK!). You should include the data and computer code at the Appendix. **Due on December 13 by the end of the day**

You’re welcome to use slides, and/or demonstrate software, and/or use the whiteboard. Assume a 10-minute time for the presentation including time for questions.

**Academic Integrity Warning:**  
A critical reminder to refrain from any form of academic dishonesty, including but not limited to copying content without proper citation. Such actions, if detected, will result in a grade of zero points and may impact your eligibility for teaching assistant positions.

**SUGGESTED OUTLINE FOR THE ARTICLE**:

 This format is structured to mimic the typical sections of a research article:

TITLE:  
- A concise and informative title that reflects the main topic of the research.

ABSTRACT:  
- Briefly summarize the research question, methods, key findings, and implications.  
- Provide a snapshot of the entire project in a clear and concise manner.

INTRODUCTION:  
- Introduce the research question or problem.  
- Provide background information on the subject.  
- Clearly state the objectives or hypotheses.

LITERATURE REVIEW (If Any):  
- Review relevant literature related to the research question.  
- Highlight existing research.

METHODOLOGY:  
- Clearly describe the study design and data sources.  
- Specify the Bayesian statistical methods used.  
- Discuss any assumptions made in the analysis.

- To the extent possible, provide the complete model (likelihood, priors, hyperpriors) and discuss why each was used. Try to focus on the statistical part rather than in the specialized content of your area.

DATA:  
- Present the data used in the project.  
- Include descriptive statistics and any necessary data preprocessing.

RESULTS:  
- Display the results of the Bayesian analysis.  
- Use tables, charts, and graphs to communicate findings effectively.  
- Include any relevant statistical measures and interpretation of results.

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DISCUSSION:  
- Interpret the results in the context of the research question.  
- Discuss the strengths and limitations of the study.  
- Compare findings with existing literature.  
- Explore the broader implications of the results.

CONCLUSIONS:  
- Summarize the key findings.

- Don't let me guess what are your findings.  
- Emphasize the contribution of the study to the field.  
- Suggest areas for future research.

REFERENCES:  
- Cite all sources used in the project following a consistent citation style (prefereably APA).

ACKNOWLEDGEMENTS (if applicable):  
- Acknowledge any individuals, organizations, or resources that contributed to the project.

APPENDICES:  
- Include any supplementary material, such as code, additional analyses, or extra figures.

FORMATTING GUIDELINES:  
- Follow the APA style.  
- Use a professional font, consistent spacing, and proper margins.

- Use graphs as appropriate

SUBMISSION INSTRUCTIONS:  
- Submit only a single PDF or Word file. Don't submit data, compressed files or R programs (R programs should be included in the Appendix. Make sure that I will be able to open your file.

RECOMMENDATIONS:

 Aim for your class project closely mirrors a real-world research article while showcasing your understanding of Bayesian statistics.

**DUE DATE IS ON DEC. 13th by the end of the day**