Progress Report 1: Bayes BATS Tier-2

Activity: Comparing Frequentist and Bayesian Approaches

AUTHORS

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Overview

Our aim for Progress Report 1 was to complete a number of "starter" artifacts ahead of creating what we believe is the heart of our activity - an application in R showing the comparison between Bayesian and frequentist hypothesis testing. Our rationale for doing so was simple: having a dataset in hand, alongside some context for that dataset, would set the stage for the application to come. As well, we created introductory and concluding discussion artifacts, as these helped frame our own thinking ahead of implementing our applied comparison activity using Bayesian and frequentist approaches.

Updated Gantt Chart

To date, we completed progress on almost all of the artifacts we planned to for the submission of Progress Report 1. Links to those artifacts are provided below. The exception is the Conclusion Discussion artifact. After our monthly meeting with Mine, we have a few things to consider in terms of assessing students' understanding of the two approaches in our conclusion, so we have pushed this artifact to Progress Report 2's due date. This change is shown in the updated Gantt chart. Finally, while we allocated the drafting of the applied R activity to Progress Report 2, we got a jump start on those materials, discussed more below.
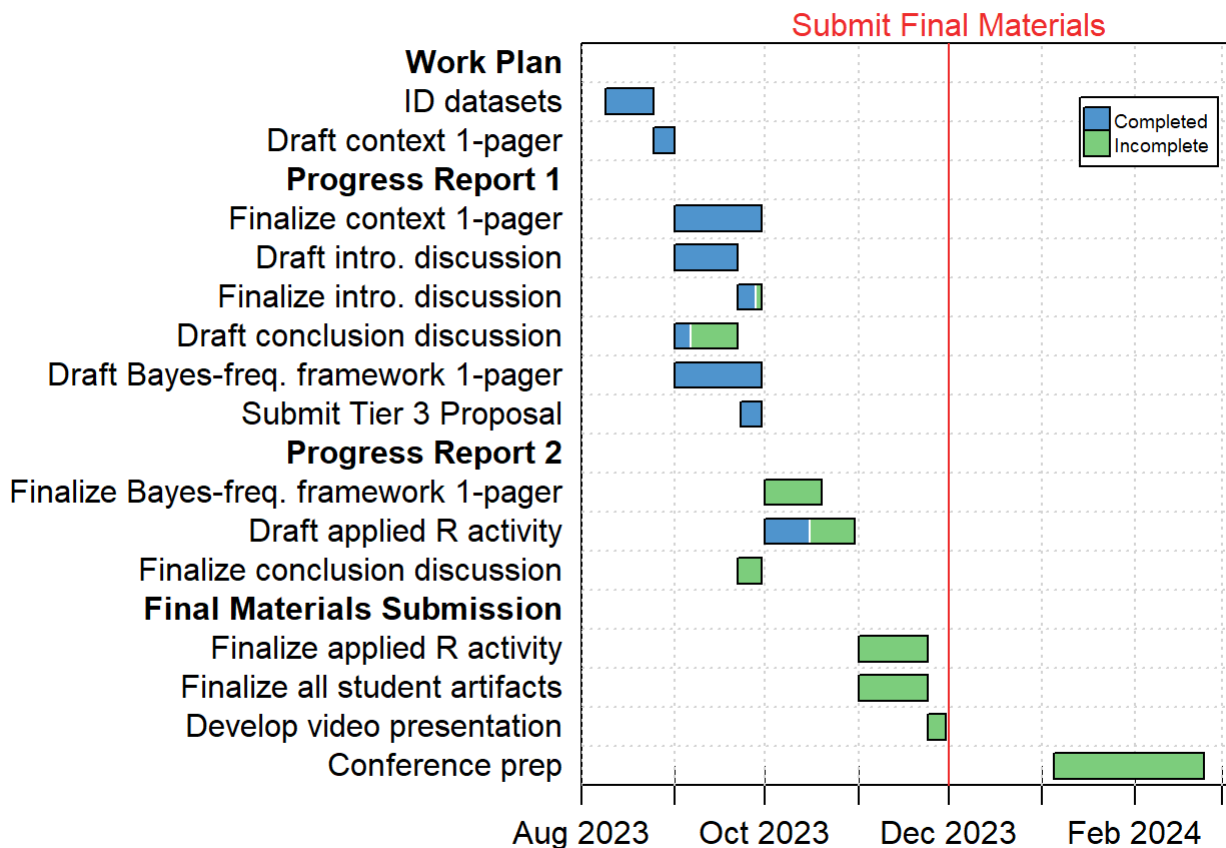
Completed Artifacts

- [Dataset: The Climate and Economic Justice Screening Tool (CEJST)](#)
- [Context Reference Guide](#)
- [Introduction Discussion](#)

Next Steps

As we move into the second phase of creating our activity and its associated artifacts, the primary area of focus will be on drafting the applied R activity. We are currently in the process of developing a [series of prototypes](#) using the CEJST data. We have also started iterating on our main activity, which includes an [analysis using the Bayesian approach](#) and an [analysis using the frequentist approach](#). These analyses come to contrasting conclusions, thus highlighting the comparative differences between the two approaches.

In our monthly meeting (2023-09-26), Mine gave us the following feedback on the activity, which we will incorporate in the next phase of work:

- Clearly articular learning objectives for faculty, and communicate these to students. In particular, this will help with measuring outcomes for educational research.

- We will also ensure that at least one learning objective focuses on the "scientific question," rather than focusing only on statistical questions.
- Emphasize that "there are no bad priors."
- Give students a way to pick their own prior. Specifically, to allow students to pick a U.S. State they think makes for a reasonable comparison with the target for inference (either Colorado or Florida).
- Document the model limitations for faculty, and possibly for students. Namely, the linear model assumes independence of the slope and intercept parameters in the prior.

Once we finalize our steps for the main applied activity, we will refine it so that it is ready for student consumption. In addition to drafting the applied `R` activity, we will also finalize the [Critical Differences Reference Guide](#) so that it aligns with the application portion of our activity. We will also finalize the [Conclusion Discussion](#). We anticipate completing these three artifacts by the time Progress Report 2 is due on 01 November.

Meeting Times

The cadence for meetings has not changed between our work plan submission and Progress Report 1, thus we will keep meeting based on the following:

- Weekly and/or bi-weekly meetings for the activity-creating team
- Monthly meetings with mentor (Mine)
- Office hours
  - 03 October 2023 with Monika (10-11a EST)
  - 16 October 2023 with Amy (2-3p EST)
  - 26 October 2023 with Mine (1-2p EST)
  - November (TBD)