Assessing and Improving Student Advising Efficiency with a Probabilistic Model to Predict No-Shows in Academic Appointments

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Abstract

No-shows at student advising appointments across functional areas and departments in student affairs practice and higher education can significantly impact time and resource utilization in advising centers. This study will develop a probabilistic model using empirical Bayesian inference to predict no-show probabilities in real time. The model incorporates student demographic data, past attendance records, appointment dates, and advising types. The study will validate the model using a dataset of student advising appointments from a U.S. institution. The model's accurate prediction will enable selective overbooking to reduce no-shows' negative effects and maintains short wait times.

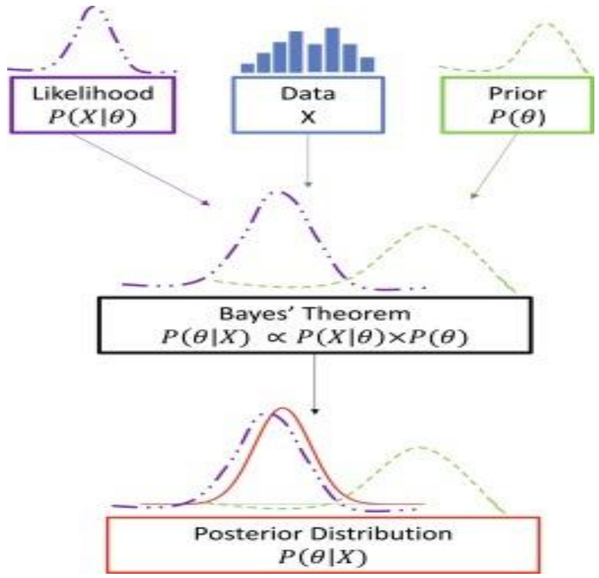
Introduction

No-show appointments not only decrease advisor productivity but also limit appointment availability for other students and increase advisors' peak workloads during key periods in the academic calendar. The purpose of this study is to develop a probabilistic model using empirical Bayesian inference to predict no-show probabilities.

Methodology

Deidentified data will be obtained from historical advising appointment data. Data points will be examined in connection with factors related to previous appointment experiences. The insights will help build a probabilistic model using empirical Bayesian inference.

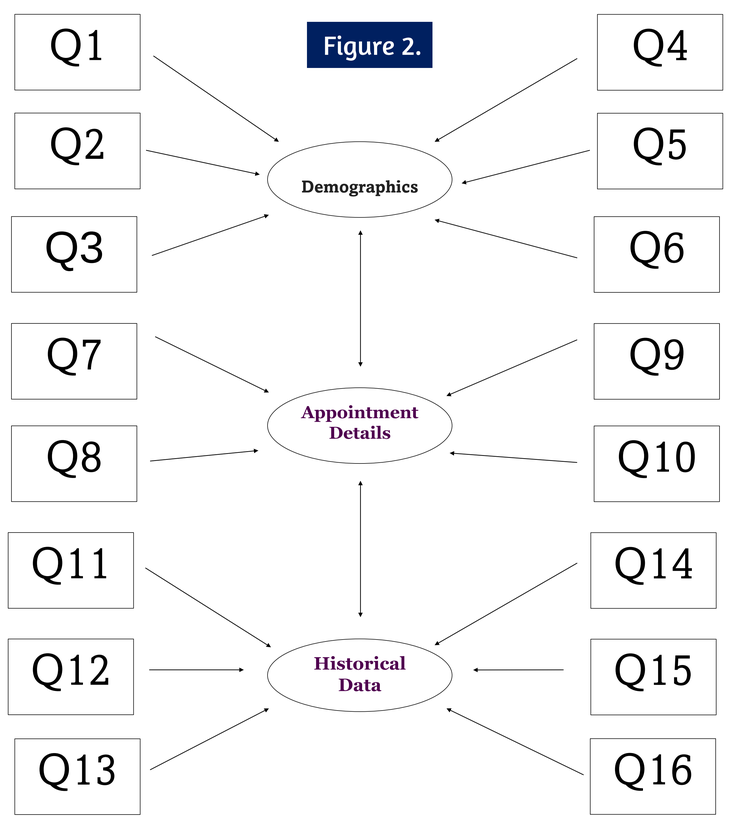
Figure 1.



Prediction steps

- Logistic regression model is formulated based on data points
- Logistic regression model is used to make initial no-show probability estimations
- Initial estimations are used in a Bayesian update procedure to find the posterior no-show probability

Figure 2.



Expected Results

– Accurate real-time predictions could enable selective overbooking to optimize advisor capacity.
– Additionally, model insights may uncover no-show trends associated with specific student populations, appointment times, or advising contexts.
– Targeted outreach efforts could then reduce no-shows through understanding and addressing their causes

Conclusion

This study aims to develop an effective predictive model to address the significant issue of no-shows at student advising appointments. By employing empirical Bayesian inference techniques and incorporating various relevant factors. the proposed probabilistic model will enable real-time prediction of no-show probabilities. A limitation of this research has been access to data to validate the design and model. Ultimately, the successful implementation of this model has the potential to mitigate the negative impacts of no-shows, optimize resource utilization in advising centers, and maintain reasonable wait times for students seeking guidance.

Acknowledgements

Barron W.M (1980) Failed appointments: who misses them, why they are missed, and what can be done. *Prim Care 7*(4):563–574

Vaziri, S., Vaziri, B., Novoa, L. J., and Torabi, E. (2021). Academic motivation in introductory business analytics courses: a Bayesian approach. *INFORMS Trans. Educ. 22*, 121–129. doi: 10.1287/ited.2021.0247

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