

MSiA 420, HW #2 Bias/Fairness Questions

Submit your B/F analyses along with the rest of HW2 as a single document.

- a)** From a bias/fairness perspective, there are only two sensitive predictors: age and gender. Discuss possible business purposes for which a predictive model (for predicting total cost of claims by a subscriber) that includes age and gender could be used. For each potential use, discuss any bias/fairness issues that could potentially arise.
- b)** Based on your modeling analyses from Problems 1—3 (in particular the ALE plots and variable importance measures) and on any additional analyses that you conduct, discuss the relative importance of the effects of age and gender on the predicted cost. If either are important, discuss how they affect the predicted cost, including any interactions they may have with other predictors.
- c)** Based on your analyses in part (b) and on any additional analyses that you conduct (e.g., using the Python Fairlearn package and/or the R Fairness package), assess whether there appear to be any bias/fairness issues with the predictive models. If so, suggest how the issues could be mitigated.
- d)** In general (i.e., for bias/fairness analyses in general and not for these particular data), discuss the risks of analyzing bias/fairness based on the relationships between the response variable and the sensitive predictor variables without considering the other predictor variables. For example, suppose you only looked at scatter plots of cost versus age and of cost versus gender. Discuss how any bias/fairness conclusions drawn only from this could be misleading. Also discuss how fitting an appropriate predictive model with all of the predictors included would better reveal any true bias/fairness issues.