Problem Set 3

Due Date: Week 11 Class

Submission: Please submit **one written report per project group** under the
"Problem Set 3" assignment. The submission will be uploaded through Gradescope, where
you will be able to select the individual pages in your report corresponding to each
problem.

Late Submission: Late assignments will not be accepted without documentation of a
valid emergency from S3/gradsupport for MIT students, or an equivalent student support
hub for non-MIT students.

Collaboration: What you turn in must be your project group's own work. Please keep
collaboration with classmates in other groups to a minimum.

Grading: Make sure that your solutions to the problems are written clearly and concisely.
You will be graded both for answering the questions correctly and for writing up your
answers in a readable manner.

In problem sets 1 and 2, we looked at different aspects of the modeling process. In this problem set, we will look at some considerations involved in the deployment of models in a clinical setting.

Answer the following questions in the context of your own final project, assuming the project will be deployed in a clinical setting upon completion. The right level of detail is around 2 single-spaced pages for the whole problem set. You may also want to include some of these answers in your project final report.

Problem 1. Dealing With Data [6 points]

(a) [**2 pts**] The data you are working with for the project has already been collected and processed. However, in a clinical setting, there is often a delay between when the data is collected and when it is entered into the system. How does your model deal with that delay? Does it still achieve its purpose even with the delay, or would you need to work around the delay for the model to be effective? If you will need to work around it, how will you do so?

(b) [**2 pts**] The data you are working with has its own distribution, but in a clinical setting you may have outlier data points that fall far beyond the tails of that distribution. How do you detect and handle outliers in such a setting?

(c) [**2 pts**] The distribution of your data might change over time, and if your model is not calibrated for this change, it might start to perform below expectations. How do you expect to handle this data drift? Briefly explain the process you would follow.

Problem 2. Model Evaluation [6 points]

(a) [**2 pts**] What metrics will you use to evaluate your model? Will you use the same metrics to evaluate the model after it is deployed?

(b) [**2 pts**] Who will be using the output of your model? How will you display the model's output to them?

(c) [**2 pts**] How do you evaluate whether your model is more effective than the currently deployed system? Do you expect to run some kind of A/B testing? If yes, describe how you will evaluate which deployed system is more effective. If not, describe the process you will use to decide on the better system.

Problem 3. Social Implications of Model Deployment [4 points]

(a) [**2 pts**] Who are the stakeholders for your project, and how will they be affected by the deployment of your model?

(b) [**2 pts**] Will you need to involve the IRB to deploy your project? If yes, briefly explain what you will need to do to get IRB approval. If not, briefly explain why your project does not need IRB approval.

HST.953 Clinical Data Learning, Visualization, and Deployments
Fall 2024