

# STAT157 HW 7

March 1, 2022

**Due Monday, March 7 at 11:59pm**

## Deliberate Practice: Prioritizing Information

*Expected completion time: – minutes*

In this deliberate practice, produce a forecast for the following question:

What will the price of crude oil be on March 8, 11:59 pm PT? (Specifically WTI Crude Futures)

using techniques from lecture, by following these steps:

1. Spend **10 minutes** brainstorming key considerations that would affect your forecast.
2. Spend **15 minutes** assigning ratings to each of the considerations for importance, uncertainty, and how quickly you can resolve the uncertainty (as in lecture 11).
3. Using those ratings, rank the considerations in order of priority to reduce uncertainty. Spend **30 minutes** using Google/other resources to reduce uncertainty on those top ranked considerations.
4. Spend **10 minutes** to re-evaluate the uncertainty on your considerations.
5. Spend **20 minutes** writing up this exercise. Please include:
  - Your considerations, ratings, which considerations you chose to research, and how much uncertainty you reduced using external sources.
  - Your final point estimate (mean estimate) for the forecast.
  - Reflections on the exercise – were some considerations harder than expected to research? If you were to do this again, would you have chosen different considerations to research with your 30 minutes?

Submit this writeup to Gradescope.

On Gradescope, please also submit the time it took to complete this exercise.

## Deliberate Practice: Structural vs. Numerical Uncertainty

*Expected completion time: – minutes*

Using the forecast you created for the above question, assess the uncertainty of your point estimate with the following steps:

1. Assess structural uncertainty:
  - Brainstorm 2 considerations relevant for structural uncertainty, i.e. considerations that could cause your previous estimate to be totally off (see Lecture 12 for examples).
  - For each of these considerations, quantify how much they would change your estimate, and quantify the probability that these considerations turn out to be true and relevant.
  - Based on this, create an 80% confidence interval around your original point estimate.
2. Assess numerical uncertainty:
  - Choose 2 of the considerations you generated above in Deliberate Practice: Prioritizing Information, and assess the sensitivity of your forecast to uncertainty in these considerations.
  - Based on this, create an 80% confidence interval around your original point estimate.
3. Combine the two sources of uncertainty into a final 80% confidence interval for the forecast question.
4. Write up your considerations, quantifications, and reflections on the final confidence intervals you produced.

On Gradescope, please also submit the time it took to complete this exercise.

## Predictions

*Expected completion time: 120 minutes*

Register the following predictions. You can submit them by going to [TODO:URL](#) and following the form's instructions. For these predictions, (and all predictions about the future throughout this class), we encourage you to use external sources – by googling things, reading news articles, talking to friends who follow politics or music stats, etc.

- 1.

For each question, submit a mean and inclusive 80% confidence interval, as well as an explanation of your reasoning (1-2 paragraphs). **Please include a copy of your google form responses with your Gradescope submission.** On Gradescope, please also submit the time it took to complete this exercise.

## Extra Credit

You can earn extra credit for doing one or both of the following tasks:

1. (2 points). Propose a prediction question for a future homework. Your question should have a fully specified resolution criteria, such that it would be clear to the course staff how to resolve it.
2. (2 points). Write down 5 “calibration-app” style questions (and answers), for a domain that is not trivia.

For the first part, you will get extra credit if we either use your question on a future homework, or like it enough to add it to our question bank for future classes.

For the second part, you will get extra credit if we think they are at least as interesting as the questions currently in the calibration app, and well-written enough to be used as a calibration question. (We may submit them to the app creator and suggest they include them!)