

# STAT 165/265 HW 7

February 28, 2024

**Due Tuesday, March 5, 2024 at 11:59pm**

## Deliberate Practice: Prioritizing Information

*Expected completion time: 90 minutes*  
*Graded on completion*

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 going through the following steps: (note that for this exercise, we intentionally want you to limit the time you spend on each step, since we are practicing prioritizing the most important considerations given time constraints – set a timer if it would help!)

1. Spend **10 minutes** brainstorming key considerations that would affect your forecast.
2. Spend **5 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 **30 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. Please note that we have a separate assignment set up for this, which is worth 1 point.

## Deliberate Practice: Structural vs. Numerical Uncertainty

*Expected completion time: 110 minutes*

*Graded on completion*

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 based on structural uncertainty.
2. Assess numerical uncertainty:
  - For 2-4 of the considerations you generated above in Deliberate Practice: Prioritizing Information, assess the sensitivity of your forecast to numerical uncertainty in these considerations.
  - Based on this, create an 80% confidence interval around your original point estimate based on numerical uncertainty (if you had additional considerations beyond these 2-4, there's no need to do extra work to explicitly assess their sensitivity, but try to subjectively include their uncertainty in this 80% interval).
3. Combine the structural uncertainty confidence interval and the numerical uncertainty interval 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. Please note that we have a separate assignment set up for this, which is worth 1 point.

## Predictions

*Expected completion time: 90 minutes*

*Graded on accuracy as part of the class forecasting competition*

Make and submit predictions to the questions on this Google Form:

<https://forms.gle/Qaeya5w9d9Veyd288>.

Be sure to follow the format described at the top of the form. For each question, you will submit a mean and inclusive 80% confidence interval or a probability (whichever the question asks for). We provide cells on the Google form for you to type out your reasoning (1-2 paragraphs), which you should submit to Gradescope with the rest of this assignment. For questions 1-3, your prediction (but not the explanation) will appear on the public leaderboard.

## Mid-semester Feedback Form

Please fill out this [feedback form](#). Since the survey is anonymous, screenshot the confirmation page and include it with your submission of this assignment to Gradescope.

## Final Project: Initial Steps

Familiarize yourself with the [final project description](#) and deadlines and start forming a group. If you'd like us to match you with a group, fill out the form on the project description page by March 5, 2024.

**[STAT 265 only] None this week!**