

STAT157 HW 2

Jan 24, 2022

Due Tuesday, January 31 at 11:59pm

Deliberate Practice: Calibration

Expected completion time: 20 minutes

Go to <https://www.openphilanthropy.org/calibration> and complete 20 questions under the Confidence Intervals (level 60%) category.

At the end, go to the “Results” tab and take screenshots showing that you completed at least 20 questions and your calibration performance (the chart that appears below the results).

Deliberate Practice: Estimation

Expected completion time: 60 minutes

For each of the following questions, estimate the answer without looking things up, then look up the answer and calculate the relative error of your estimate¹. For each quantity, we provided one link with a reasonable-seeming answer, which you should use as the “official” answer when you calculate the error. We recommend spending around 5 minutes on each estimation question.

In addition to the questions below, devise two estimation questions of your own, for quantities you are interested in. Again, estimate the answer without looking things up, then look up a reasonable answer and compute your relative error.

1. How many cattle are in the world in 2022?
2. What’s the length of the SF Bay Bridge, in meters?
3. How heavy, in tons, is the Titanic?

¹Note that some of these questions still leave some ambiguity depending on specific definitions, and different Google search results might give slightly different answers!

4. How many paid subscribers of Netflix are there as of December 2022?
5. How many statistics and biostatistics degrees (Bachelors) were given in the U.S. in 2021?
6. What was the GDP of Mexico in 2021?
7. How many musicians are employed in the U.S.?
8. What's the depth of the deepest hole, in meters, that humans have dug?

Here are our links that contain answers:

1. <https://www.statista.com/statistics/263979/global-cattle-population-since-1990/>
2. https://en.wikipedia.org/wiki/San_Francisco%E2%80%93Oakland_Bay_Bridge
3. <https://en.wikipedia.org/wiki/Titanic>
4. <https://www.demandsage.com/netflix-subscribers/>
5. <https://magazine.amstat.org/blog/2022/12/01/statsbiostatsdegree/>
6. <https://countryeconomy.com/gdp/mexico>
7. <https://www.zippia.com/musician-jobs/demographics/>
8. https://en.wikipedia.org/wiki/Kola_Superdeep_Borehole

On Gradescope, for each of the **10 questions (8 provided plus 2 created by you)**, please submit your estimate, your relative error, and a brief explanation of your reasoning (e.g. what quantities you used as part of the decomposition and how you combined them). Your explanation can be brief and does not have to be complete sentences. **The purpose of these questions is to get practice making estimates, rather than to get all the answers right. You will not be graded on accuracy, but instead on whether you made a reasonable attempt and learned from your mistakes.**

Lab

Expected completion time: 90 minutes

[Link to Jupyter notebook.](#)

Please follow the instructions in the notebook to print out your code and answers and submit to Gradescope. You may use languages other than Python, although we will generally be providing starter code in Python.

Predictions

Expected completion time: 60 minutes

Register the following predictions. You can submit them by going to <https://docs.google.com/forms/d/1He18wwYU8sha8fwbHUPUNdvNxi7LFkr2w-1xpsmbGhE/edit> 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.

0. Pick the same website, application, or software you chose last week, and predict how much time you will spend on it between 12:00am Wednesday February 1st and 11:59pm Monday February 7th, as measured by your time-tracking app.
1. On February 1st at 2pm EST, the U.S. Federal Reserve (the Fed) is planning to announce interest rates. Note that the federal interest rate is a range (e.g. 5% – 5.25%), and we will resolve the forecast based on the upper value in the range. In terms of units, report your answer as a percentage (e.g. 4.9 would mean a 4.9% interest rate).
2. Will Taylor Swift's *Anti-Hero* top the [Billboard Hot 100](#) on the week of February 5th?
3. How many club tables will be there at 1PM in Upper Sproul on February 1st? It should be any table with the visible name of an organization, including empty tables. This question will be resolved based on count by course staff.

For each question, submit a mean and inclusive 80% confidence interval (or a probability for question 2), as well as an explanation of your reasoning (1-2 paragraphs). **Please include a copy of your google form responses with your Gradescope submission.**