I. **Sections to Read** (All content from DeGroot and Schervish's *Probability and Statistics* unless otherwise noted) A digital copy of the textbook is available for on our class PWeb site, under the Day One Access tab.

(a) Section 7.5

II. **Objectives** (By the end of the day's class, students should be able to do the following:)

- State the definition of a likelihood function and of the maximum likelihood estimator for a parameter.
- Implement the method of maximum likelihood in order to produce a reasonable estimator for a given parameter.
- Discuss drawbacks of the maximum likelihood estimator, and provide examples where these drawbacks occur.

III. **Reflection Questions** (Submit answers on Gradescope `https://www.gradescope.com`)

1) True or False? The maximum likelihood estimator for $\theta$ is obtained by finding the value of $x$ that makes $f(x|\theta)$ as large as possible, that is, by solving $\frac{\partial}{\partial x} f(x|\theta) = 0$.
2) Consider the following two statements below. Identify which statement is the correct interpretation of the MLE and which is the incorrect interpretation. For the incorrect interpretation, specify why is the statement is incorrect.
   i. *The MLE is most probable value of $\theta$, given the data* $\mathbf{x}$.
   ii. *The MLE is the value of $\theta$ that maximizes the probability of observing the data* $\mathbf{x}$.

IV. **Additional Feedback** Are there any topics you would like further clarification about? Do you have any additional questions based on the readings / videos? *If not, you may leave this section blank.*