

## Pre-class preparation

Please read the following textbook sections from Degroot and Schervish's *Probability and Statistics* (fourth edition) or watch the video, as indicated:

- Video: <https://expl.ai/JHHFZLF>

## Objectives

By the end of the day's class, students should be able to do the following:

- State the definition of the likelihood ratio test, and perform a likelihood ratio test for a particular likelihood function.
- Understand how maximum likelihood estimation relates to the likelihood ratio test.
- Identify the asymptotic distribution of the likelihood ratio test statistic under the null hypothesis, and use it to obtain a p-value.

## Reflection Questions

Please submit your answers to the following questions to the corresponding Canvas assignment by 8:45AM:

1. In your own words, explain what the likelihood ratio statistic  $\Lambda(\mathbf{x})$  represents. Then briefly discuss why small values of  $\Lambda(\mathbf{x})$  represent data that are inconsistent with the null hypothesis  $H_0 : \theta \in \Omega_0$ .
2. Looking at the denominator of the likelihood ratio statistic  $\Lambda(\mathbf{x})$ , what is the “name” of the value of  $\theta$  at which we should evaluate the likelihood?
3. (Optional) Is there anything from the pre-class preparation that you have questions about? What topics would you like some more clarification on?