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/UCSHAZL` , or
- Textbook: Section 9.1 (pg. 530 - 532 only)

Objectives

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

- State the definition of the Null and Alternative hypotheses in the language of parameter spaces, both for simple and composite hypotheses, and in terms of one- and two-sided hypotheses.
- Give the definition of the test procedure, the critical region and the test statistic for a hypothesis test.
- Conduct hypothesis tests in a variety of frameworks for real data.
- State the definition of the power function and explain how it relates to the critical region and the probability of Type I and Type II errors.

Reflection Questions

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

1. Suppose $\mathbf{X}$ is a sample from $N(\mu, 1)$ with μ unknown, and that we wish to test the following hypotheses:
$$H_0 : \mu = 0 \qquad H_1 : \mu \neq 0$$
Consider the following test procedures:
   - δ_1: Reject H_0 if $\bar{X} \geq 2$
   - δ_2: Reject H_0 if $|\bar{X}| \geq 2$

   Which testing procedure δ_1 or δ_2 would you prefer? Briefly explain why.
2. In your own words, summarize the relationship between the partition of the parameter space into subsets Ω_0 and Ω_1 and the partition of sample space into subsets S_0 and S_1.
3. (Optional) Is there anything from the pre-class preparation that you have questions about? What topics would you like would you like some more clarification on?