Pre-class preparation

Please read the following textbook sections from Blitzstein and Hwang's *Introduction to Probability* (second edition) OR watched the indicated video from Blitzstein's Math 110 YouTube channel:

- Textbook: Sections 2.1-2.3
- Video: Lecture 4: Conditional probability

Objectives

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

- Define conditional probability in terms of set theory notation and in everyday language.
- Explain the difference between a conditional probability and an unconditional probability.
- States Bayes' rule and the Law of Total Probability.
- Apply Bayes' rule and the Law of Total Probability to compute desired probabilities.

Reflection Questions

Please submit your answers to the following questions to the corresponding Canvas assignment by 7:45AM:

1. Suppose a box has three red marbles and two blue marbles. You randomly select three marbles, one at a time, without replacement. Define A as the event that the first marble is red. Define B as the event that the last two marbles are red. Show that $P(A|B) \neq P(B|A)$ by computing both conditional probabilities.
2. Describe a reason why/when we might use Bayes' rule.
3. In a certain forest in late summer (I won't say which), the probability of encountering chantarelle mushrooms after a day of rain is 0.8. If it didn't rain the day before, then the probability of encountering a chantarelle mushroom is 0.1. In late summer, there's roughly a 0.4 chance of rain everyday. What is the probability that I find a chantarelle mushroom tomorrow?
4. (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? *If nothing, assign this question to the first page of your submission.*