

## Assignment for Friday, March 31

Before class, do the following:

Read FPP ch. 13, pp. 221-236. Do the following exercises:

- Set A, pp. 225-226: 1-3, 5.
- Set B, p. 227: 1-4. Pay special attention to “Technical Notes” at the end of the section.
- Set C, pp. 229-230: 1-3, 7. You need to memorize the multiplication rule. Also, pay special attention to the differences between (a) and (b) in questions 1-3.
- Set D, p. 232: 1-7. Note that independence is a critical concept to everything we do for the rest of the semester. Make sure you understand it.

In class, we’ll do review exercises 2-7 and 9 together.

Make sure you review the chapter summary on p. 236 before class.

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For one-half point extra credit in the class, you can do the following (**on your own!**) and hand it in at the beginning of class. Hand-written is fine.

Suppose two events  $A$  and  $B$ .<sup>1</sup> Below, I’ve written two facts from the chapter using the notation described in the “Technical Notes” on p. 227. Use these two facts to derive or prove a simpler version of the multiplication rule for independent events.<sup>2</sup> Be sure to write this simpler multiplication rule in the notation I use below. Hint: Like most proofs, this doesn’t require a profound insight.

**Multiplication rule:**  $P(A \text{ and } B) = P(A) \times P(B|A)$

**Independence:** Say that  $A$  and  $B$  are independent if and only if  $P(A) = P(A|B)$ .<sup>3</sup>

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<sup>1</sup>For concreteness, you might think of  $A$  as rolling a six with a six-sided die and  $B$  as drawing an ace from a 52-card deck, but the events are arbitrary.

<sup>2</sup>This simpler rule is discussed in the box on p. 232.

<sup>3</sup>Note that dependence is symmetric ( $P(A) = P(A|B)$  if and only if  $P(B) = P(B|A)$ ), so we can consider either case.