

9-9 NB0203

9-9: Wrangling Notebook CSCI 3022 Fall 19

Opening **Example**: Suppose we flip a coin with a 1% chance per flip of landing on heads. Define X= the number of tails flips before we see a heads. What is P(X=0)? P(X=1)? P(X=i)? Verify that P(X)=1 over all of Ω .

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Common Problem?

1) How many years

until we see 18in

rain?

Z) Hon long until

Lions win supe

Bowl?

Opening Example Sol'n

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$$P(\Lambda) = P(\chi \in \{0, 1, 2, --- \})$$

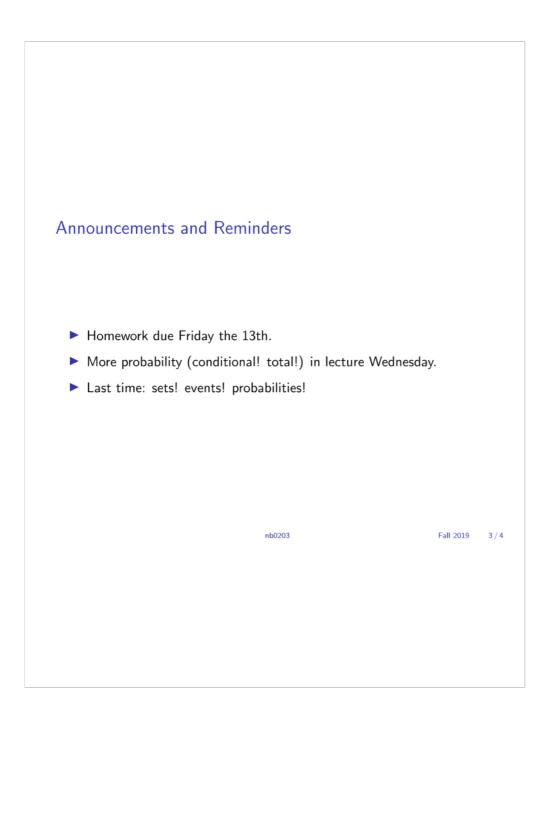
$$\sum_{i=0}^{\infty} P(\chi = i) = \sum_{i=0}^{\infty} .99^{i} .01 = \frac{.01}{1 - (.99)} = \frac{.01}{.01 - 1}$$

Opening Example Sol'n

Suppose we flip a coin with a 1% chance per flip of landing on heads. Define X= the number of tails flips before we see a heads. What is P(X=0)? P(X=1)? P(X=i)? Verify that P(X)=1 over all of Ω .

- 1. $P(X = 0) = P({H}) = .01$.
- 2. $P(X = 1) = P({TH}) = P({T})P({H}) = .99 \cdot .01$.
- 3. $P(X = 2) = P({TTH}) = P({T})^2 P({H}) = .99^2 \cdot .01.$
- **4.** $P(X = i) = P(\{T ... TH\}) = P(\{T\})^{i} P(\{H\}) = .99^{i} ..01.$
- 5. $\sum_{i=0}^{\infty} P(X=i) = \sum_{i=0}^{\infty} .99^i \cdot .01 = \frac{.01}{1-.99} = 1$. Sanity check passed!

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NB01

NB01

It's our second notebook day! Let's get rowdy in here.

- ▶ nb02, 03 and the data sets are on the course page.
- ► Check out the various cheat sheets on the course Modules/Resources page.
- ► Talk to and work with your neighbor(s). Seriously. You have all of your spare time to solve problems on your own, there's cognitive processes that have to be built and maintained by collaborating! Plus it's more fun (I hope).

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