

STAT/MA 41600  
In-Class Problem Set #5: September 2, 2016

- 1.** Consider two dice. One is a 6-sided die that has 2 red sides and 4 green sides. The other is a 4-sided die that has 1 red side and 3 green sides. One die is selected at random and rolled. The result is red. What is the conditional probability that the first die (i.e., the one with 2 red sides and 4 green sides) was chosen?
- 2.** Research company Gartner suggests that 80.7% of people own an Android, and 17.7% own an iPhone. For simplicity, assume nobody owns both types. Also assume that the other 1.6% of people do not have a cell phone. Suppose that 90% of iPhone customers are “satisfied,” and 70% of Android customers are “satisfied”, and 0% of people without a cell phone are satisfied.
  - 2a.** If you meet a satisfied customer, what is the probability they own an iPhone?
  - 2b.** If you meet an unsatisfied customer, what is the probability they do not own a cell phone?
  - 2c.** If you interview people until you meet the first Android customer, and then you stop after that, what is the probability that you meet 4 or more people?
- 3.** The website <http://joshmadison.com/mms-color-distribution-analysis/> claims that 24% of M&M's are blue, 13% are brown, 16% are green, 20% are orange, 13% are red, and 14% are yellow. Suppose that 10% of reds, blues, yellows, and greens are broken, and 15% of browns and oranges are broken.
  - 3a.** If you blindly grab a broken M&M, what is the probability that it is red?
  - 3b.** If you blindly grab a whole (non-broken) M&M, what is the probability that it is blue?
- 4.** Bob flips a coin until he gets a head for the first time, and then he stops afterwards. Say it takes him  $n$  flips.

Based on that number  $n$ , Bob's friend Alice flips a coin exactly  $n$  times. What is the probability that Alice gets no heads at all, during her  $n$  flips?