STAT/MA 41600
In-Class Problem Set #16: September 21, 2018

1. At Purdue, approximately 53% of students are Indiana residents. Purdue has a large number of students, so if we start interviewing people randomly, it is perhaps safe to assume that their residencies are independent. If we interview people until we find the first Indiana resident, what is the expected number of interviews that we conduct? What is the variance?

2. Suppose that Alicia has a 6-sided die and Bob has a 4-sided die. They continue rounds of rolling (1 roll per person, simultaneously) until Alicia's die has the (strictly) higher value. How many rounds of rolls are expected?

3. Consider a Geometric random variable X with $\mathbb{E}(X) = 1/p$.
3a. Find the probability that X is even.
3b. Find the probability that X is a multiple of 3.

4. Mary selects bears (with replacement) with 6 possible colors, all of which are equally likely to appear. She continues to select bears until the first purple or orange bear occurs. What is the expected number of blue bears that appear during this process?