STAT 215C – Homework
Due March 6

Instructions:

Please include the following information on the first page of your completed homework.

- Name

- STAT 215

- Homework 5

- Due date

- List of students you worked with (if applicable)

Please remember to show your work and explain answers as necessary. Answers that are not supported by good reasoning will not receive full credit. Homework should be stapled if it is longer than one page.

Section 3.5: 75

Baseball. Suppose the probability that a baseball player will get a hit during a given at bat is $p = 0.3$. Let Y denote the number of times he strikes out before getting 3 hits. Assume we are not considering the option of walking (so either he gets a hit or is out).

1. What kind of distribution does Y have (give name and parameter values)?

2. What is the average number of times he will get out before his 3rd hit? What is the average number of times he will be at bat until his 3rd hit?

3. Calculate the probability that he strikes out at least twice before getting his 3rd hit.

4. Calculate the probability that he gets his 3rd hit on his 7th at bat.

Section 3.6: 82, 87

Airport Metal Detectors. Of people passing through an airport metal detector, 0.5% activate it. Let X be the number among a randomly selected group of 500 people that activate the detector.

1. Can the Poisson approximation to the Binomial be used here? Check the conditions.

2. Calculate the probability that five of the people activate the detector (to 6 digits) using the Binomial pmf.

3. Calculate the probability that five of the people activate the detector based on the Poisson pmf (to 6 digits).

4. How much did the probabilities differ between the Binomial and Poisson calculations?

Section 4.1: 1, 4, 6