

STAT 221 Introduction to Probability and Statistics Winter 2012

Quiz 6

Assigned on Tues Jan 17; due on Wed Jan 18. You may work with a group of as many as 4 students, submitting one quiz with all names, provided that you all contribute to the work. You may use your notes.

A reader wrote in to the “Ask Marilyn” column in *Parade* magazine to say that his grandfather told him that in $\frac{3}{4}$ of all baseball games, the winning team scores more runs in one inning than the losing team scores in the entire game. (This phenomenon is known as a “big bang.”) Marilyn responded that this proportion seemed to be too high to be believable. To investigate this claim, I examined the 45 Major League baseball games played on September 17–19, 2010.

1. Was this a random sample of all Major League baseball games played in the 2010 season? Explain briefly.

2. Restate the grandfather’s assertion as a null hypothesis and Marilyn’s response as an alternative hypothesis, in both symbols and in words.

I found that 21 of the 45 games played on those dates contained a big bang.

3. Calculate the sample proportion of games that had a big bang, and denote it with the appropriate symbol.

4. Assume (for now) that the grandfather’s claim is true, and use the Simulation-Based One-Proportion Inference applet to simulate 1000 samples of 45 games per sample. Describe how to calculate the approximate p-value from this simulation, and report its value.

5. Would you conclude that the sample data provide strong evidence to support Marilyn’s contention that the proportion cited by the grandfather is too high to be the actual value? Explain your reasoning, as if writing to the grandfather, who has never taken a statistics course.