**Day 1 Homework**

Descriptive Statistics

|  |  |
| --- | --- |
| Mean | 1360.55 |
| Median | 1360.48 |
| Lower Quartile | 1360.2 |
| Upper Quartile | 1360.83 |
| 45th percentile | 1360.44 |
| 60th percentile | 1360.59 |

Inferential Statistics



Inferential Statistics - A First Hypothesis Test

*Motivation & Description of Experimental Procedure*

We conducted an experiment to see if Michael could predict a coin flip.

At home on Tuesday, November 13, 2018, Minh flipped a coin, and while the coin was in the air, Michael predicted whether the coin would land heads or tails. The coin was flipped sixteen times. For each flip, the prediction, the result of the flip, and whether the prediction was right or wrong was recorded.

*Null Hypothesis*

Our null hypothesis is that Michael is not able to predict a coin flip at all. Under this hypothesis the probability of a successful prediction is 0.50.

*Alternative Hypothesis*

Our alternative hypothesis is that Michael is able to predict a coin flip, to at least some degree.

*Test Statistic*

Our test statistic is the number of coin flips that were correctly predicted. The test statistic follows a binomial distribution, which we will learn more about later.

*Rejection Region*

We are willing to admit that Michael can predict a coin flip to some degree provided the number of correct predictions is 14 or more.

We will typically omit this section, but for now you can use the graph on the next page and shade in the rejection region.

*Results & Significance*

Michael predicted 11 coin flips correctly.

If Michael has no ability to predict a coin flip, we expect the number of correct predictions to be this great or greater with a probability of approximately .4119.

*Formal Conclusion*

There is insufficient evidence to reject the hypothesis that Michael is not able to predict a coin flip in favor of the hypothesis that Michael has some power to predict a coin flip.

*Informal Discussion*

Michael predicted more than half of the coin flips correctly, but not so many that we think Michael has very much, if any, prediction ability. Perhaps more experiments would reveal that Michael actually has a small ability to predict a coin flip.

*Technical notes & documentation*

Computations were performed using Excel version 16.0.4738.1000.

