

Lecture 26

Friday, November 15, 2024 11:30 PM

Practice finding the interval of confidence and margin of error on the worksheet.

Hypothesis testing: sometimes, a hypothesis about a population is made based on experience or some background knowledge about the population. Statistics is then carried out to test that hypothesis. For example, you may hypothesize that the coin is fair (meaning, the chance to get Heads is $1/2$). If you realize that, after tossing 100 times, there are only 35 Heads, you should have reason to doubt your hypothesis. The chance of obtaining such an outcome is

$$\binom{100}{35} \left(\frac{1}{2}\right)^{100} \approx 0.000864$$

In Mathematica:

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Probability[x==35,x \[Distributed] BinomialDistribution[100,0.5]]
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You have obtained a sample statistics that should occur with a chance of only 0.0864%, which is quite a rare event. You have a good reason to reject the hypothesis that the coin is fair.

Null hypothesis (H_0) is the hypothesis that says that a population parameter is *equal* to some value. Alternative hypothesis (H_1) is the hypothesis that says that a population parameter is *not equal* to some value.

If you have obtained a sample statistics that should occur with a chance of only 5%, you may reject the null hypothesis at the significant level of 0.05. More generally, if you have obtained a sample statistics that should occur with a chance of less than or equal to p , you may reject the null hypothesis at the significant level of p .