

Math 140

Introductory Statistics

Professor B. Abrego
Lecture 20
Sections 10.2, 10.3

1

Example: One-Sided P -Values

- A book about different colleges reports that the mean time students at a particular university study each week is 1015 minutes. A dean says she believes the mean is greater than 1015 minutes. To test her claim, she takes a random sample of 64 students and finds the sample mean is 1050 minutes, with standard deviation 150 minutes. Is this strong evidence in favor of her claim?

Example: Distance from the Sun

- "Earth is 93 million miles from the Sun." You have probably heard or read that often. But is it true? The table on the right shows 15 measurements made of the average distance between Earth and the Sun (called the Astronomical Unit, abbreviated A.U.), including Newcomb's original measurement from 1895. Use these data to test the hypothesis that they are consistent with the true mean A.U. being 93 million miles. Use a .05 significance level.

Astronomical Unit (millions of miles)
93.28
92.83
92.91
92.87
93.00
92.91
92.84
92.98
92.91
92.87
92.88
92.92
92.96
92.96
92.81

Honda Civic Hybrid Gas Mileage

- Owners of hybrid cars have been known to exaggerate their gas mileage. For example, the EPA estimated that overall miles per gallon for the 2007 Honda Civic Hybrid is 42 miles per gallon (mpg). The first 40 owners to post their own miles per gallon on the EPA web site reported a mean of 43.3 mpg with a standard deviation of 5.06 mpg. Is this statistically significant evidence that all 2007 Honda Civic Hybrid owners would report, on average, higher gas mileage than the EPA estimate? Conduct the test at the 5% significance level. [Source: www.fueleconomy.gov.]