proprep

Workbook

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Confidence Intervals for Comparing Two Sample Means

Confidence Intervals for Comparing Two Sample Means

Questions

1) We want to examine whether there is a difference between the scores of college students and high school students on an IQ test. Scores on this IQ test are known to follow a normal distribution with a standard deviation of 100. The average score in a sample of 16 college students was 543, and the average score in a sample of 20 high school students was 508. Construct a 95% confidence interval for the difference between the test score averages of college and high school students.

2) A given IQ test has a normal distribution with a standard deviation of 15.
The average score in a sample of 20 Europeans was 104, and the average score in a sample of 23 Americans was 99. Construct a confidence interval at a 95% level of confidence for the difference in average IQ between Europeans and the US.

3) A construction engineering company wants to compare the strength of two types of nails. Nail strength is distributed normally with a standard deviation of 4 units.
The average strength in a sample of 15 Type A nails was 28 units, and the average strength in a sample of 12 Type B nails was 25 units. At what level of certainty would it be decided that there is no difference between the average strength of these types of nails?

4) A random sample of 45 law students studies 4 hrs/week on average, with a standard deviation of 2 hrs. A random sample of 55 engineering students studies 10 hrs/week on average, with a standard deviation of 3 hrs.
Estimate the difference in weekly study rates between law and engineering students, at a 95% level of certainty.

5) 100 people from NYC and 107 people from LA were randomly sampled: NYers watched an average of 2.7 hours, with a standard deviation of 0.7 hours. LAers watched an average of 1.8 hours, with a standard deviation of 1.1 hours. Find a 95% confidence interval for the difference between the cities in weekly rate of TV watching.

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Answer Key:

1) $\left(-30.74,\ 100.74\right)$

2) $\left(-3.989,\ 13.989\right)$

3) 94.71%

4) $\left(-6.998,\ -5.002\right)$ OR $\left(5.002,\ 6.998\right)$.

5) $\left(0.6488,\ 1.1512\right)$

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