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ECON 453

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PS2

* 1. The 95% confidence interval for average test score is (58.99051, 65.50949).
  2. We fail to reject the null (true mean = 63) and fail to accept the alternative ( true mean =/= 63) as the p-value is 0.6505.
  3. We can reject the null (both schools have the same average score) and accept the alternative (the schools have different average scores), as the p-value is 0.002052

2.1 (A screenshot of a white box

AI-generated content may be incorrect.

2.2 At a confidence level of 95%, the confidence interval is ($219,708.7, $258,534.3).

2.3 When looking at all homes, we get a p-value of 0.00000000000000022. This means that we can conclusively reject the null and accept the alternative, meaning that sale prices are NOT equal on average between homes <2000 and >2000 sq ft. When looking at my university specifically (University of Alabama) the p-value was 0.0000000000007236, meaning that we can once again reject the null and accept the alternative (sale prices are not even between big and small homes)

3.1 B. How unusual would it be to get a sample average of 35 or more customers if the manager had not offered the discount?

SE = = 2.68

Z-score = = 1.87

The probability of a Z-score of 1.87, and thus the probability of randomly getting a sample average of 35, is 3.07%

B. Do you feel confident that the manager’s discount strategy has worked? Explain.

I feel very confident that the manager’s strategy worked, because there is such a low (but not impossible) probability that it happened randomly. However, I think it would be best to continue the study and get a bigger sample size before implementing anything.

3.2 Suppose that the miles-per-gallon (mpg) rating of passenger cars is normally distributed with a mean and a standard deviation of 33.8 and 3.5 mpg, respectively.

1. What is the probability that a randomly selected passenger car gets more than 35 mpg?

P(MPG >35)

z-score: (35-33.8)/3.5 = 0.34

looking at standard table and using the z- score, find that the probability is 36.69% that a randomly selected car has a MPG > 35.

1. What is the probability that the average mpg of four randomly selected passenger cars is more than 35 mpg?

3.5/ sqrt(4) = 1.75

z-score: (35-33.8)/1.75= 0.69

looking at standard table and using the z- score, find that the probability is 24.51% that four randomly selected car has a MPG > 35.

1. If four passenger cars are randomly selected, what is the probability that all of the passenger cars get more than 35 mpg?

(0.3669)^4 (probability of single car with >35mpg, ^4) = 0.0181

The probability that four randomly selected cars all have and mpg >35 mpg is 1.81%