20. You want to compare housing prices in your community (measured in thousands of dollars) to the national values of µ= 496, σ= 36.3. Recently, 4 houses on your street were sold for a mean price of 476. Report the standard error of the mean and Z in your answers to the following questions. (8 marks)

a. Can you conclude that the mean price of housing in your community is different from the national mean at a statistically significant level?

b. How would your conclusion from a. change if you had obtained a sample of n= 81 with a mean of 483?

c. How would your conclusion from b. change if you realized that actually σ= 96.3?

Answer:

* 1. The standard error of the mean of 4 houses sold in my community is 18.15. The z value of this mean is -1.10 If we use a standard alpha level of .05, this z value falls within the critical region (-1.96 and +1.96 on each tail), so we cannot reject the null hypothesis that the mean price of my community is not different from the national mean at a statistically significant level.
  2. The standard error of the mean of 81 houses sold in my community would then be 4.03. The z value of this mean would then be -3.22. If we also use a standard alpha level of .05, this z value falls beyond the critical region of -1.96 and +1.96 on each tail. Therefore, we have to reject the null hypothesis that the mean price of my community is not different from the national mean at a statistically significant level.
  3. In such case, the standard error would then become 10.7 and the z value of this mean is -1.21. This z value is not in the critical region of -1.96 and +1.96 on each tail. Therefore, we the mean price of my community is once again not different from the national mean at a statistically significant level.

1. You have conducted an experiment and found that after treatment the mean of your sample was 57. The population parameters for the dependent variable are µ= 52, σ= 15. Your null hypothesis was rejected and you will use Cohen’s d to calculate the effect size. In one sentence, report the magnitude and evaluation of the effect size. (2 marks).

Answer:

The Cohen’s d is 0.33 which means the treatment effect is equal to one third of the standard deviation, which is an effect of a magnitude between small and medium.

1. You are in an Intro Psych class of 137 students. You ask 25 of your classmates their age and calculate a mean of 18.2 and a sample standard deviation of 1.5. Calculate the standard error and report the 80% and 99% confidence intervals for the estimated average age of the class. (6 marks)

Answer:

The standard error is 0.3. The point estimate and 80% Confidence Interval for the mean is 18.2 +/- 0.4 (18.6, 17.8) and the point estimate and 99% Confidence Interval for the mean is 18.2 +/- 0.75 (18.95, 17.45). 23. 28, 12

1. Calculate Pearson’s r and the coefficient of determination from the data. Summarize your findings in a sentence that interprets both r and r2.

Answer:

The Pearson’s r is +0.71 meaning the relatively high value for the correlation indicates that the points are quite tightly clustered close to a straight line, and the coefficient of determination (r2) is +0.50 which means that 50% of the variability in the Test 2 results can be predicted from the relationship with Test 1.

1. You are investigating the relationship between centimeters of snowfall and cheerfulness for Canadians in mid-January. You have obtained the following values:

SP = 35 SSx= 105 Mx=1.7 MY= 3.1

a. Calculate the slope and intercept, then report the regression equation for Y. (4 marks)

b. Describe how cheerfulness is predicted to change with each cm of snowfall. Include the appropriate quantification. **(2 marks)**

Answer:

* 1. Slope = 0.33. Y-intercept is 2.539. The regression equation for y is Y = 0.33(1.7) + 2.539
  2. Assuming the measurements of cm of snowfall are 2, 3, 4, 5, 6 cheerfulness will then become, as a result of Y = bX + a, 3.2 units, 3.53, 3.86, 4.19, 4.52, and 4.85. This means the cheerfulness is predicted to be in a positive slope with the increse of each cm of snowfall.

1. A large retailer manages inventory by using the regression equation Y’ = 0.65 X + 240 to predict the amount people will spend on clothing based on the amount they spend on entertainment.
   1. If a person spends nothing on entertainment, how much would their predicted clothing expenditure be? (1 mark)
   2. If a person spends $800 on entertainment, how much would their predicted clothing expenditure be? (1 mark)

Answer:

a. $240

b. $760