Neshma Simon

1. (15 points) Please answer the following; you might find it useful to make a sketch.

a. For a Normal Distribution that has mean 1 and standard deviation 6.5, what is the area to the left of 1.65?

Online calc:

0.5398

b. For a Normal Distribution that has mean 8 and standard deviation 2.7, what is the area in both tails farther from the mean than 13.67?

Online calc:

0.035729

c. For a Normal Distribution that has mean -11 and standard deviation 4, what is the area in both tails farther from the mean than -5.4?

Online calc:

0.1770

d. For a Normal Distribution that has mean 14 and standard deviation 7.4 what two values leave probability 0.158 in both tails?

Online calc: p-value: 1.00271

14-7.420054=

14+7.420054=

6.579946 and 21.420054

e. A regression coefficient is estimated to be equal to 6.56 with standard error 4.1; there are 24 degrees of freedom. What is the p-value (from the t-statistic) against the null hypothesis of zero?

6.56/4.1=1.6

Online calc:

0.122681

f. A regression coefficient is estimated to be equal to -0.24 with standard error 0.4; there are 4 degrees of freedom. What is the p-value (from the t-statistic) against the null hypothesis of zero?

-.24/0.4=-0.6

Online calc:

0.580841

2. (10 points) As we consider, "did everything change after March 2020?" look at crude oil prices. The average daily return of crude oil was 0.000145 with standard deviation of 0.0213 in 289 days before March 1. Average daily return after that date was -0.0210 with standard deviation of 0.271 in 174 days after. Is there a statistically significant difference in the mean? Calculate t-stat and p-value for the test against no difference in daily returns.

   0.000145- -0.0210= 0.021145
   289-174=115
   0.0213-0.271=-0.2497

   Online calc:
   t-stat : 0.000183
   p-value: 0.9984
   therefore, it is not statistically significant.

3. (10 points) In good news, there was information about vaccine trials. Consider (these are not quite the actual data but a simplified version) looking at 2 groups, each with 10,000 people. In the control group who did not get the vaccine there were 90 infections. In the test group that did get the vaccine there were 15 infections. Calculate the t-stat and p-value for the test against no difference in infection rates between groups.

Online calc:
p-value: 0.9962
t-stat: 0.0053

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