Lesson 10: Inference for One Mean - Sigma Known (Confidence Interval)

Homework

Solutions

Problem	Part	Solution
1	-	90%
2	-	We are 95 % confident that the actual mean price is between $ 225500 and $ 341800 . Also, if we were to do the same process (sampling and estimation) over and over, the confidence interval would contain the true mean listing price approximately 95 % of the time.
3	-	The probability is either 0 or 1. This is because the true mean is a fixed value that does not change. The sample mean varies depending on the random sample that was collected and therefore so does the confidence interval. A probability expresses the proportion of the times that an event happens if a random process is repeated over and over again. The population mean does not change so you cannot have a probability associated with it; it may be between $ 225500 and $ 341800 or it may not, but it will either be in that interval 100% of the time or 0% of the time. We cannot say with certainty, so we say that the probability is either 0 or 1.
4	-	- A simple random sample was drawn from the population - $\bar{x}$ is normally distributed - σ is assumed to be known
5	-	9.2
6	-	0.322
7	-	(8.878 , 9.522) We are 90% confident that the true mean number of hours is between 8.878 and 9.522
8	-	(8.817 , 9.583) We are 95% confident that the true mean number of hours is between 8.817 and 9.583
9	-	(8.696 , 9.704) We are 99% confident that the true mean number of hours is between 8.696 and 9.704
10	-	As the level of confidence increases, the interval width also increases.
11	-	n = 2760
12	-	0.16
13	-	0.006
14	-	(0.154 , 0.166) We are 95% confident that the true mean BAC is between 0.154 and 0.166
15	-	(0.155 , 0.165) We are 95% confident that the true mean BAC is between 0.155 and 0.165
16	-	As the sample size increases, the interval width decreases.

Problem	Part	Solution
17	-	Although we cannot be certain that $\mu = 0.159$ g/dL without examining the entire population, the value does lie within all of our intervals. So, although we cannot be certain it is exactly equal to 0.159, we can see that it is within the range of possible values and it is possible that it is 0.159
18	-	n = 6147
19	-	If we wanted 100% confidence, we would get information from the entire population and we would not need to create a confidence interval. Since we typically don't have the time or the money to do that, we settle on a sample and estimate the mean using a confidence interval typically between 90-99% confidence.
20	-	II. We are 95% confident that the true mean is between the lower and upper bounds. III. Approximately 95% of all 95% confidence intervals would contain the true mean.