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1. A study is conducted with a $95 \%$ confidence interval resulting in $1.52<\mu<2.64$. Identify the sample mean and the margin of error.
2. You are looking to complete a study that analyzes the levels of carbon dioxide in the air. You take a random sample of 55 readings and know that the average level is 1.675 ppm with a standard deviation of 0.57 ppm . Find a $90 \%$ confidence interval for your study.
3. For the study in problem 2 , what is the margin of error?
4. If we increased the level of confidence to $92 \%$, what should happen to your interval? Why?
5. A sample of size $n=100$ produced the sample mean of $\bar{x}=16$. Assuming the population standard deviation $\sigma=$ 3 , compute a $95 \%$ confidence interval for the population mean $\mu$.
6. The operations manager of a large production plant would like to estimate the mean amount of time a worker takes to assemble a new electronic component. Assume that the standard deviation of this assembly time is 3.6 minutes. After observing 120 workers assembling similar devices, the manager noticed that their average time was 16.2 minutes. Construct a $95 \%$ confidence interval for the mean assembly time.
7. To assess the accuracy of a laboratory scale, a standard weight that is known to weigh 1 gram is repeatedly weighed 4 times. The resulting measurements (in grams) are: $0.95,1.02,1.01$, and 0.98 . Assume that the weighing by the scale when the true weight is 1 gram is normally distributed with mean $\mu$. Use these data to compute a $95 \%$ confidence interval for $\mu$.
8. Based on a sample of 1000 workers at a factory, a $95 \%$ confidence interval is calculated for the mean work times of all employees. The time interval is $27.4<\mu<49.6$.
a. What is the sample mean?
b. Find the margin of error.
