

Confidence Intervals.

- To determine an average weight of a bag of apples in certain supermarket 100 bags were examined. Assume that the weights of different bags are independent normal random variables with unknown mean μ and standard deviation $\sigma = 0.5$. The mean weight of the bags under consideration was 2.8 lbs.

 - Construct confidence intervals for μ with confidence levels 90%, 95% and 99%.
 - How many bags need to be examined so that the length of the 99% confidence interval is less than 0.1 lbs?
- 50 statistics students pick up 100 bags of apples each in 50 different Maryland stores and construct 95% confidence intervals using their data. Find the probability that exactly 3 students will come up with intervals which do not contain population mean.
- A waiting time for a bus at John's work has uniform distribution on the interval $[0, \theta]$. During the first 10 days at work the maximal time John had to wait for the bus was 12 min. Construct 95% confidence interval for the maximal waiting time θ .
- An average water consumption for a certain home during 2011 was 135 gal/day with sample standard deviation of 25 gal/day. Compute large sample confidence interval for the mean water consumption at that home with confidence level 95%.
- A new drug given to 49 patients resulting in lowering their systolic blood pressure on average by 20 units with sample standard deviation of 10 units. Let μ be the mean drop in the blood pressure achieved by the drug. Compute large sample lower 95% confidence bound for μ .
- 62 out of 100 Maryland students admitted that they will not do homework assignment if it is ungraded.

 - Find the score confidence interval with confidence level 95% for the proportion of students who will not do homework if it is ungraded.
 - Compare this interval with large sample confidence interval using estimated variance.
- Calls to a technical support center of a certain company form Poisson process. During 168 hours the center received 210 calls.

 - Find the score confidence interval with confidence level 95% for the intensity of calls.
 - Compare this interval with large sample confidence interval using estimated variance.
- The total amount of money deposited in a brunch of a certain bank has normal distribution. The study of total amount of deposits was conducted for n days and resulted with sample mean of 105K and sample standard deviation of 9K.

 - Compute the 95% confidence interval for the mean daily deposit if $n = 5$.
 - Compute the 95% confidence interval for the mean daily deposit if $n = 51$ and compare it with large sample confidence interval.
 - Compute the 95% lower confidence bound for the mean daily deposit if $n = 5$.
 - Compute the 95% confidence interval for the next day deposit if $n = 51$.