Exercise 1: Ages of Vehicles

A survey of 30 adults found that the mean age of a person's primary vehicle is 5.6 years. Assuming the standard deviation of the population is 0.8 year, find the best point estimate of the population mean and the 99% confidence interval of the population mean.

The best point estimate of the mean is 5.6 years.

$$5.6 - 2.58\left(\frac{0.8}{\sqrt{30}}\right) < \mu < 5.6 + 2.58\left(\frac{0.8}{\sqrt{30}}\right)$$

$$5.2 < \mu < 6.0$$

One can be 99% confident that the mean age of all primary vehicles is between 5.2 and 6.0 years, based on a sample of 30 vehicles.

Exercise 2: Depth of a River…

A scientist wishes to estimate the average depth of a river. He wants to be 98% confident that the estimate is accurate within 2 feet. From a previous study, the standard deviation of the depths measured was 3.38 feet.

98% → $z = 2.33$, $E = 2$, $\sigma = 3.38$

$n = (2.33*3.38/2)^2 =$ 15.5

Therefore, to be 98% confident that the estimate is within 2 feet of the true mean depth, the scientist needs at least a sample of 16 measurements.