Conditions

2. Suppose that 100 people are sampled at random and their average web browsing time per week is 3.2 hours with a standard deviation of 2.5 hours. Construct the 99% confidence interval for the population mean.

Solution

$$\mathbb{P}\left(\bar{X} - z_{\frac{1-\alpha}{2}}\frac{\sigma}{\sqrt{n}} \leq \mu \leq \bar{X} + z_{\frac{1-\alpha}{2}}\frac{\sigma}{\sqrt{n}}\right) = \alpha$$

$z_{0,99} = 2{,}326$

Lower point of the confidence interval:

$$3.2 - 2.326 \cdot \frac{2.5}{10} = \mathbf{2.6185}$$

Upper point of the confidence interval:

$$3.2 + 2.326 \cdot \frac{2.5}{10} = \mathbf{3.7815}$$

Answer: $\mathbf{2.6185 \leq \mu \leq 3.7815}$