ASSIGNMENT 7

CCS226-18

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2BSCS-1

CONSTRUCT A 90%, 95%, AND 99% CONFIDENCE INTERVAL OF THE MEAN WEIGHT OF CELL PHONES IF 100 RANDOMLY SELECTED CELL PHONES HAVE A MEAN WEIGHT OF 180 G AND STANDARD DEVIATION OF 30 G.

Given:

$\bar{X}$ = 180 g σ = 30 g N = 100 phones

90% CONFIDENCE INTERVAL

Given:

$\alpha = 0.1$

$\alpha/2 = 0.05$

$Z_{\alpha/2} = 1.645$

Margin of error:

$SE = Z_{\alpha/2}(\sigma/\sqrt{n})$

$= 1.645\ (30/\sqrt{100})$

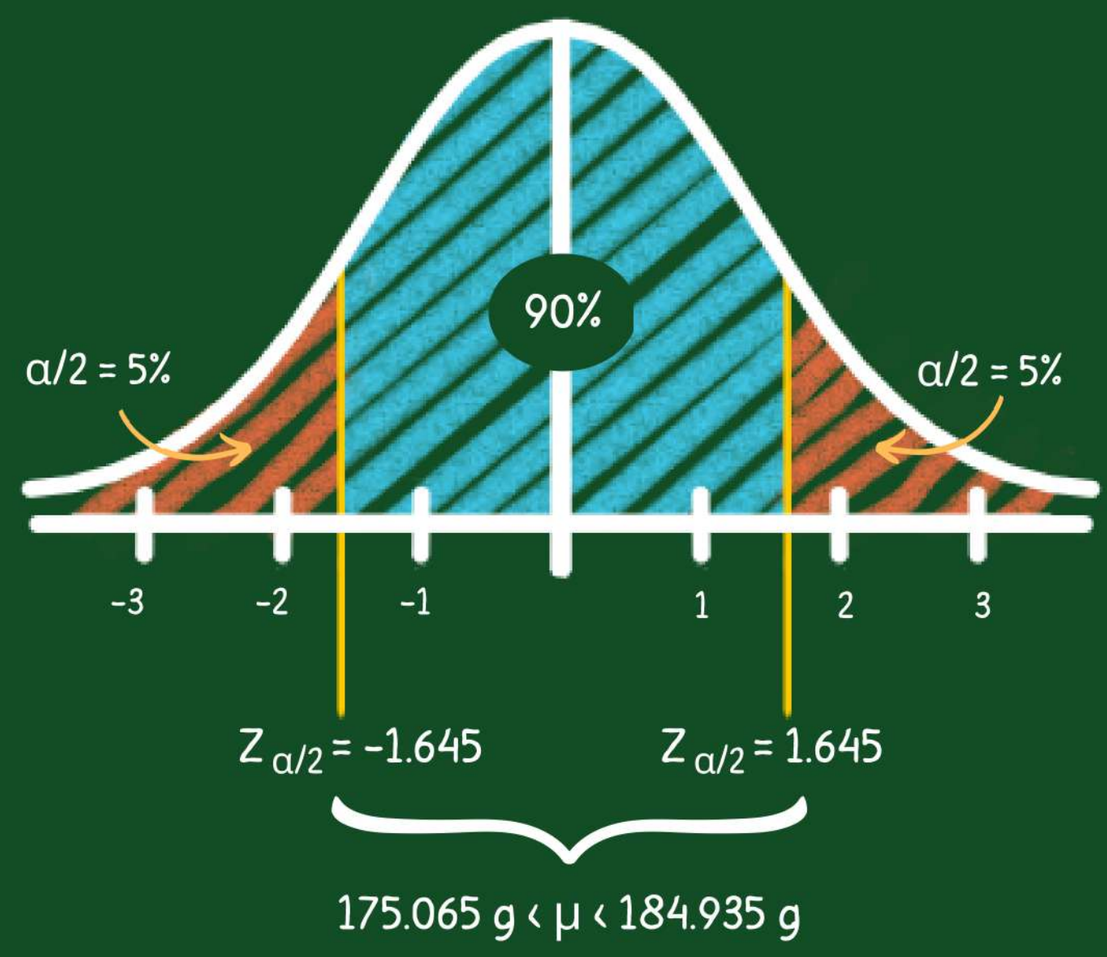
$SE = 4.935$

Confidence Interval:

$\bar{X} - SE < \mu < \bar{X} + SE$

$180 - 4.935 < \mu < 180 + 4.935$

$175.065\ g < \mu < 184.935\ g$



The mean weight of cell phones will be between 175.065 g and 184.935 g at a confidence level of 90%

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95% CONFIDENCE INTERVAL

Given:

$\alpha = 0.1$

$\alpha/2 = 0.025$

$Z_{\alpha/2} = 1.96$

Margin of error:

$SE = Z_{\alpha/2} (\sigma/\sqrt{n})$

$= 1.96 (30/\sqrt{100})$

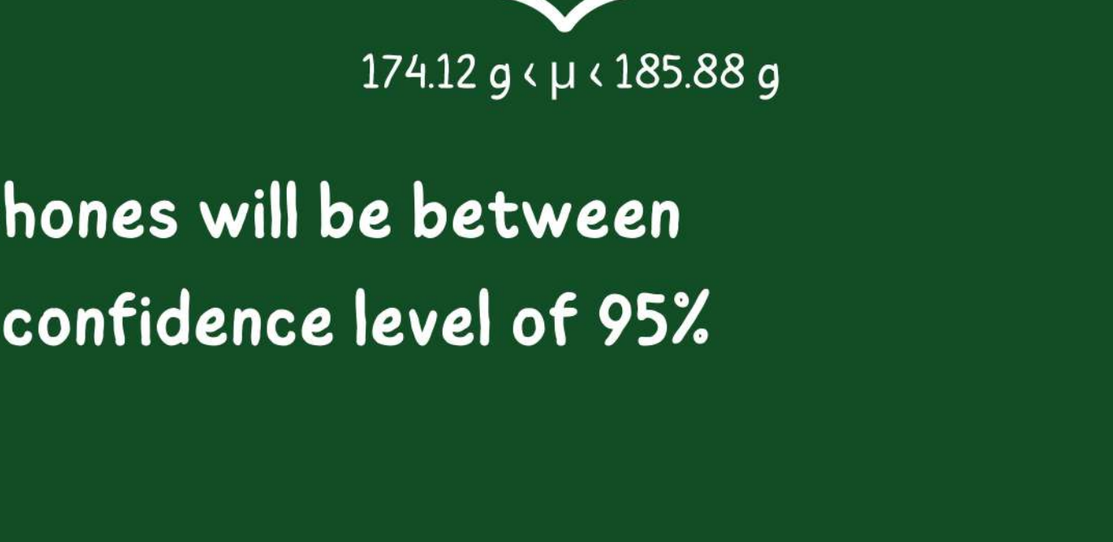
$SE = 5.88$

Confidence Interval:

$\bar{x} - SE < \mu < \bar{x} + SE$

$180 - 5.88 < \mu < 180 + 5.88$

$174.12 < \mu < 185.88$



The mean weight of cell phones will be between 174.12 g and 185.88 g at a confidence level of 95%

99% CONFIDENCE INTERVAL

Given:

$\alpha = 0.1$

$\alpha/2 = 0.005$

$Z_{\alpha/2} = 2.576$

Margin of error:

$SE = Z_{\alpha/2} (\sigma/\sqrt{n})$

$= 2.576 (30/\sqrt{100})$

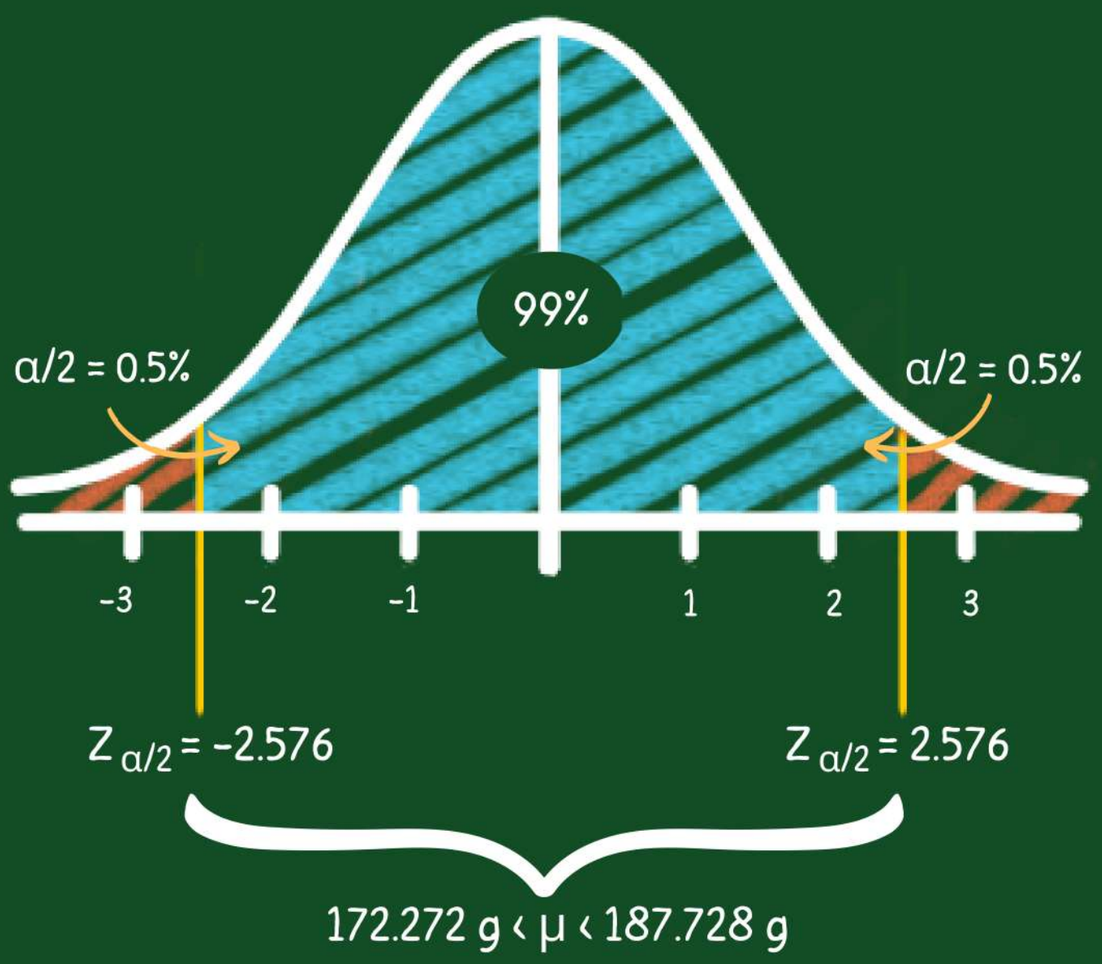
$SE = 7.728$

Confidence Interval:

$\bar{x} - SE < \mu < \bar{x} + SE$

$180 - 7.728 < \mu < 180 + 7.728$

$172.272 < \mu < 187.728$



The mean weight of cell phones will be between 172.272 g and 187.728 g at a confidence level of 99%