EXE 1: Confidence Interval Estimation Using SPSS.

OBJECTIVE: The objective of this lab is to estimate the 95% confidence interval for the mean height of a given dataset using SPSS software.

QUESTION:

Find confidence interval of mean assuming normal distribution for following data.
Height:

78, 55, 68, 48, 65, 76, 57, 55, 65, 75, 51, 61, 68, 67, 76, 78, 71, 56, 57, 67, 58, 51, 50, 58, 50, 77, 55, 48, 70, 55, 58, 69, 76, 61, 68, 78, 56, 78, 57, 66, 66, 74, 62, 74, 76, 50, 69, 75, 65, 48, 70, 56, 52, 74, 61, 66, 48, 73, 71, 70

WORKING EXPRESSION:

The confidence interval for the mean is calculated using the formula:

$$CI = \bar{X} \pm Z \times \frac{\sigma}{\sqrt{n}}$$

where: _

X = sample mean
Z = critical value for 95% confidence level (1.96 for a normal distribution)
6 = standard deviation
n = sample size

CALCULATION:

From SPSS output:

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
height	60	100.0%	0	0.0%	60	100.0%

Descriptives

			Statistic	Std. Error
height	Mean		63.8833	1.23327
	95% Confidence Interval for Mean	Lower Bound	61.4156	
		Upper Bound	66.3511	
	5% Trimmed Mean		63.9815	
	Median		65.5000	
	Variance		91.257	
	Std. Deviation		9.55287	
	Minimum		48.00	
	Maximum		78.00	
	Range		30.00	
	Interquartile Range		16.50	
	Skewness		-.136	.309
	Kurtosis		-1.258	.608

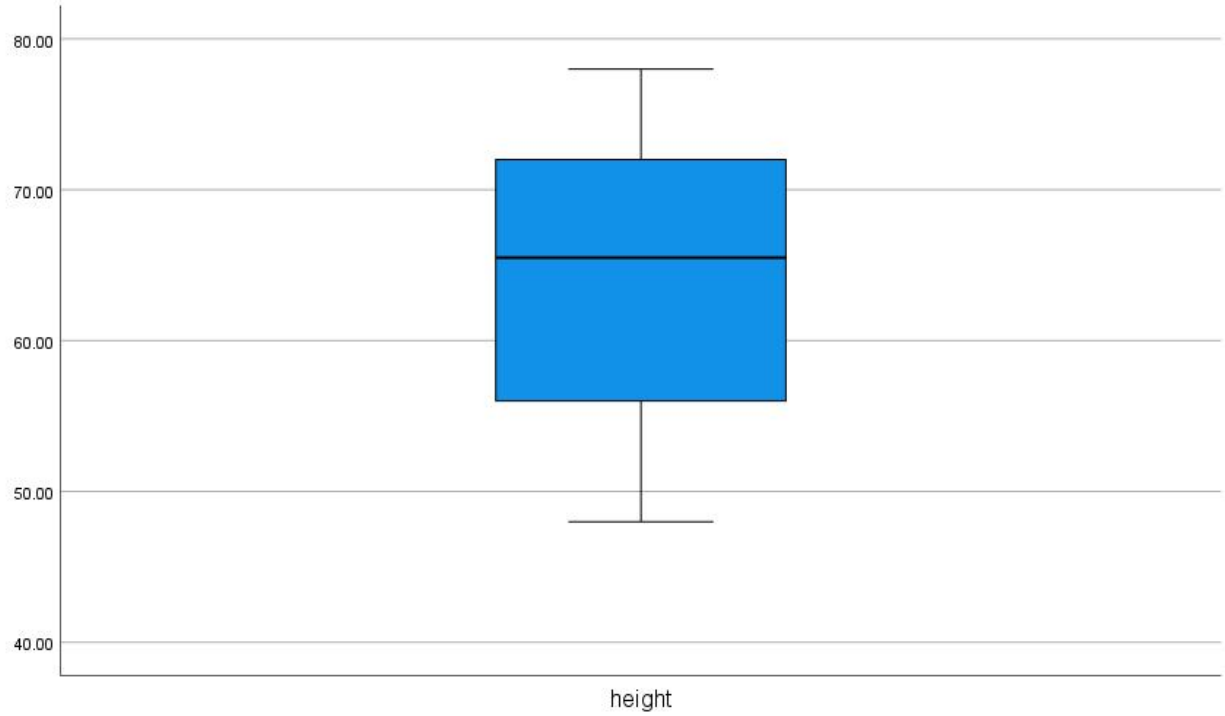

Figure: Boxplote of the given question.

RESULT:

The computed 95% confidence interval for the mean height is (61.42, 66.35).

CONCLUSION:

The results indicate that we can be 95% confident that the true mean height of the population falls within the interval (61.42, 66.35). The data appears to be normally distributed, making the confidence interval estimation valid.