

Day #17 Exercise – SOLUTIONS

Below are some measurements from a simulation model – these are thought to be representative samples from a population. What is the 95% confidence interval (CI)? What is the accuracy of the CI? A T-score table is given below.

10
12
14
13
15
17

$$\bar{Y} = \frac{1}{6} \cdot (10 + 12 + 14 + 13 + 15 + 17) = 13.5$$

$$S = \sqrt{\frac{1}{6-1} \cdot [(10-13.5)^2 + (12-13.5)^2 + \dots + (17-13.5)^2]} = \sqrt{5.9}$$

$t_{\alpha/2} = 2.57$ (for 95% confidence we use $\alpha = 0.05$ and $N = 6$ degrees of freedom, so we use the $N - 1 = 5$ row)

$$H = 2.57 \cdot \left(\frac{\sqrt{5.9}}{\sqrt{6}} \right) = 2.55$$

Thus, the population mean (μ) is between 10.95 and 16.05 with 95% confidence. The accuracy of the CI is $2.55/13.5 = 19\%$.

Selected values of $t_{\alpha/2; N-1}$

	$\alpha/2 = 0.05$	$\alpha/2 = 0.025$
N - 1	t	t
4	2.13	2.78
5	2.02	2.57
6	1.94	2.45
7	1.90	2.37
8	1.86	2.31
9	1.83	2.26
10	1.81	2.23
11	1.80	2.20
12	1.78	2.18