STANDARD ERROR

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The standard error (SE)   is the approximate standard deviation of a statistical sample. It is a statistical term that measures the accuracy with which a sample distribution represents a population by using standard deviation. Sample mean deviates from the actual mean of a population, which is the standard error of the mean. Hence, the relationship between the standard error of the mean and the standard deviation is such that, for a given sample size, the standard error of the mean equals the standard deviation divided by the square root of the sample size. That is the standard error of the mean is a measure of the dispersion of sample means around the population mean.

Calculation of Standard error

Procedure:

Step 1: Calculate the mean.

Step 2: Calculate each measurement's deviation from the mean.

Step 3: Square each deviation from mean. Squared negatives become positive.

Step 4: Sum the squared deviations.

Step 5: Divide that sum from step 4 by one less than the sample size.

Step 6: Take the square root of the number in step 5. That gives the "standard deviation (S.D.)."

Step 7: Divide the standard deviation by the square root of the sample size (n). That gives the "standard error".

Step 8: Subtract the standard error from the mean and record that number. Then add the standard error to the mean and record that number.

Q. Find the standard error of the following data

170, 170.5, 160, 161, 150, 155

Answer.

Variales (X)	X-M (Variales-Mean)= m	M²
170.5	170.5 – 161 = 9.5	90.25
170	170 – 161 = 9	81
161	161 – 161 = 0	0
160	160 – 161 = -1	1
155	155 – 161 = -6	36
150	150 – 161 = -9	81
Mean= 161		$\sum$M² = 289.25

Divide by number of measurements-1. $\sum$ (X-M)² / (n-1) = 289.25/5 = 57.85

Standard deviation = square root of $\sum$ (m-i)2/n-1 = $\sqrt{57.85}$ = 7.6

Standard error = Standard deviation/$\sqrt{n}$ = 7.6/$\sqrt{6}$ = 2.44