

VITAL MATHEMATICS



STATISTICS
VARIANCE

STEVIE CARPENTER

INTRODUCTION

The variation is the square of the standard deviation. Nothing more or less.

VARIANCE EQUATION

$$s^2 = \left(\frac{\Sigma(x - \bar{x})}{n - 1} \right)$$

\bar{x} ($x - bar$) – Sample mean

Σ (Sigma) – Summation

x – Data value

n – Sample size

s^2 – Sample variance

$$\sigma^2 = \left(\frac{\Sigma(x - \mu)}{N} \right)$$

μ (mu) – Population mean

N – Population size

σ^2 – Population variance

SOLVING VARIANCE

$$s^2 = \left(\frac{\Sigma(x - \bar{x})}{n - 1} \right) \quad \sigma^2 = \left(\frac{\Sigma(x - \mu)}{N} \right)$$

STEP 1) Calculate the mean

$$\bar{x} = \frac{\Sigma x}{n}$$

$$\mu = \frac{\Sigma x}{N}$$

STEP 2) Subtract each data value from the mean

STEP 3) Add all values from STEP 2

STEP 4) Divide STEP 3 by $(n - 1) / N$

Example: $\frac{STEP\ 3}{n - 1} (Sample)$ or $\frac{STEP\ 3}{N} (Population)$

STEP 5) Round answer two decimal places

STEP 6) Provide Conclusion

VARIANCE EXAMPLE

Example 1: Find the variance speed of the following cars below:

25mph, 70mph, 40mph, 40mph, 63 mph, 89mph, 126mph

Example 2) Find the variance age of the following people listed below:

17yrs, 25yrs, 19yrs, 36yrs, 55yrs, 22yrs, 45yrs, 11yrs, 47yrs

Concepts Concerning the Variance

The variance is never negative, only zero if all values are the same or positive. The variance uses the same units as the data values, but expressed to second power (ft^2). Outliers can change the standard deviation drastically. The sample variance is a unbiased estimator of the population variance.



VITAL MATHEMATICS

BY

STEVIE CARPENTER

INSTA: VITALMATHEMATICS

FB PAGE: VITAL MATHEMATICS

YOUTUBE: VIITAL MATHEMATICS

