Coefficient of Variation Example

This document presents an example of calculating the Coefficient of Variation (CV).

Datasets:

Class A Heights (cm): [150, 160, 155, 165, 158]

Class B Heights (cm): [170, 180, 175, 165, 172]

Calculating Mean and Standard Deviation:

Class A:

1. Mean (mu_A):

   mu_A = (150 + 160 + 155 + 165 + 158) / 5 = 157.6 cm

2. Standard Deviation (s_A):

   Squared differences:

   (150 - 157.6)^2 = 57.76

   (160 - 157.6)^2 = 5.76

   (155 - 157.6)^2 = 6.76

   (165 - 157.6)^2 = 54.76

   (158 - 157.6)^2 = 0.16

   Sum of squared differences = 125.2

   Variance (s_A^2) = 125.2 / (5 - 1) = 31.3

   Standard Deviation (s_A) = sqrt(31.3) approximately 5.6 cm

Class B:

1. Mean (mu_B):

   mu_B = (170 + 180 + 175 + 165 + 172) / 5 = 172.4 cm

2. Standard Deviation (s_B):

   Squared differences:

(170 - 172.4)^2 = 5.76

(180 - 172.4)^2 = 57.76

(175 - 172.4)^2 = 6.76

(165 - 172.4)^2 = 54.76

(172 - 172.4)^2 = 0.16

Sum of squared differences = 125.2

Variance (s_B^2) = 125.2 / (5 - 1) = 31.3

Standard Deviation (s_B) = sqrt(31.3) approximately 5.6 cm

Calculating Coefficient of Variation:

Class A:

CV_A = (s_A / mu_A) * 100 = (5.6 / 157.6) * 100 approximately 3.55%

Class B:

CV_B = (s_B / mu_B) * 100 = (5.6 / 172.4) * 100 approximately 3.24%

Conclusion:

Although the standard deviations are the same for both classes, Class A has a slightly higher coefficient of variation, indicating that the heights of students in Class A are relatively more variable in comparison to their mean height than those in Class B.