

Variance of 1D datasets

Quiz, 5 questions

5/5 points (100%)



Congratulations! You passed!

Next Item



1 / 1
point

1.

What is the variance of the following dataset?

$$\mathcal{D} = \{1, 2, 3, 2\}$$

Please use decimal numbers in your answer.

0.5

Correct Response

Well done!



1 / 1
point

2.

What is the standard deviation of the dataset $\mathcal{D} = \{1, 2, 3, 2\}$ which we already used in the previous question? You should provide a decimal number as your answer.

0.707

Correct Response

Indeed: You just needed to take the square-root of the variance.



1 / 1
point

3. Variance of 1D datasets

What would be the new variance if we added 1 to each element in the dataset $\mathcal{D} = \{1, 2, 3, 2\}$ from Question 1? Please use decimal numbers in your answer.

5/5 points (100%)

0.5

Correct Response

Yes: adding a constant to the dataset does not change its variance.



1 / 1
point

4.

What would be the new variance if we multiplied each sample in a dataset \mathcal{D} by 2.



The variance of the new dataset will not change.



The variance of the new dataset will be four times the variance of \mathcal{D} .

Correct

Well done!



The variance of the new dataset will be two times the variance of \mathcal{D} .



1 / 1
point

5.

Assuming we have mean \bar{x}_{n-1} and variance σ_{n-1}^2 for some dataset \mathcal{D}_{n-1} with $n - 1$ samples. What would be the variance σ_n^2 if we add a new element x_* to the dataset (assuming you have computed the new sample mean \bar{x}_n)?



$$\sigma_n^2 = \frac{n-1}{n} \sigma_{n-1}^2 + \frac{1}{n-1} (x_* - \bar{x}_{n-1})(x_* - \bar{x}_n)$$



$$\sigma_n^2 = \frac{n-1}{n} \sigma_{n-1}^2 + \frac{1}{n} (x_* - \bar{x}_{n-1})^2$$



$$\sigma_n^2 = \frac{n-2}{n-1} \sigma_{n-1}^2 + \frac{1}{n} (x_* - \bar{x}_{n-1})(x_* - \bar{x}_n)$$



$$\sigma_n^2 = \frac{n-1}{n} \sigma_{n-1}^2 + \frac{1}{n} (x_* - \bar{x}_{n-1})(x_* - \bar{x}_n)$$

Correct

Great job!

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