

Your grade: 100%

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1. What is the variance of the following dataset?

1 / 1 point

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

Please use decimal numbers in your answer.

0.5

✓ **Correct**

Well done!

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.

1 / 1 point

0.707

✓ **Correct**

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

3. 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.

1 / 1 point

0.5

✓ **Correct**

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

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

1 / 1 point

- ☐ The variance of the new dataset will be two times the variance of \mathcal{D} .
- ☒ The variance of the new dataset will be four times the variance of \mathcal{D} .
- ☐ The variance of the new dataset will not change.

✓ Correct
Well done!

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) ?

1 / 1 point

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

✓ Correct
Great job!