Mean of datasets

TOTAL POINTS 6

1. What is the mean of the dataset $\mathcal{D} = \{1, 2, 3\}$?

   1 / 1 point

   Do the exercises using pen and paper.

   ○ 3

   ○ 6

   ⦿ 2

   ✓ **Correct**
   That's it. Good job!

2. Compute the mean of the following dataset:

   1 / 1 point

   $$\mathcal{D} = \left\{ \begin{bmatrix} 1 \\ 4 \\ 7 \end{bmatrix}, \begin{bmatrix} 2 \\ 5 \\ 8 \end{bmatrix}, \begin{bmatrix} 3 \\ 6 \\ 9 \end{bmatrix} \right\}$$

   Do the exercises using pen and paper.

   ⦿ $\begin{bmatrix} 2 \end{bmatrix}$

   ○ $\begin{bmatrix} 3 \\ 3 \\ 3 \end{bmatrix}$

   ○ $\begin{bmatrix} 18 \\ 18 \\ 18 \end{bmatrix}$

   ✓ **Correct**
   Well done!

5. Assuming that we know the mean $\bar{x}_{n-1}$ of a dataset $\mathcal{D}_{n-1}$ with $n - 1$ data points. Now, suppose that we collect another data point, which we denote by x_*. Select the correct formula that computes the correct new mean $\bar{x}_n$ of the full data set $\mathcal{D}_n = \mathcal{D}_{n-1} \cup \{x_*\}$, i.e., we add x_* to the dataset $\mathcal{D}$.

   1 / 1 point

   ○ $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n+1} (\bar{x}_{n-1} - x_*)$

   ○ $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n-1} (x_* - \bar{x}_{n-1})$

   ⦿ $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n} (x_* - \bar{x}_{n-1})$

   ○ $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n+1} (x_* - \bar{x}_{n-1})$

   ✓ **Correct**
   Excellent!

6. Assuming you are given an image as a two dimensional array of shape 28 x 28. Write a small piece of python code to reshape this image to a vector of length 784 (=28 x 28).

   1 / 1 point

   Hint: This can be a one-liner.

   ```
   1  import numpy as np
   2
   3 ▾ def reshape(x):
   4      """return x_reshaped as a flattened vector of the multi-dimensional array x"""
   5      x_reshaped = x.reshape(x.shape[0]*x.shape[1])
   6      return x_reshaped
   7
   ```

   Run

   Reset

   ✓ **Correct**

   Good job!