Your grade: 100%

Your latest: **100%** • Your highest: **100%** • To pass you need at least 80%. We keep your highest score.

Next item →

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

   1 / 1 point

   Do the exercises using pen and paper.

   - ⦿ 2
   - ○ 6
   - ○ 3

   > ✓ **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.

   - ○ $\begin{bmatrix} 6 \\ 15 \\ 24 \end{bmatrix}$
   - ○ $\begin{bmatrix} -2 \\ -5 \\ -8 \end{bmatrix}$
   - ⦿ $\begin{bmatrix} 2 \\ 5 \\ 8 \end{bmatrix}$

   > ✓ **Correct**
   > Well done!

3. What is the mean of the following dataset, **after** multiplying each sample in the dataset by 2?

$$D = \left\{ \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix}, \begin{bmatrix} 5 \\ 3 \\ 1 \end{bmatrix} \right\}$$

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

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

⦿ $\begin{bmatrix} 6 \\ 6 \\ 6 \end{bmatrix}$

✓ **Correct**

Well done!

4. What is the mean of the following dataset, **after** adding $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ to each sample in the following dataset?

$$D = \left\{ \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix}, \begin{bmatrix} 5 \\ 3 \\ 1 \end{bmatrix} \right\}$$

⦿ $\begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$

○ $\begin{bmatrix} 2 \\ 1 \\ 0 \end{bmatrix}$

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

✓ **Correct**

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 $\mathcal{D}$.

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

✓ **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).

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 = np.reshape(x, (-1,))
6       return x_reshaped
7
```

Run

Reset

✓ **Correct**

Good job!