1. In logistic regression given $\mathbf{x}$ and parameters $w \in \mathbb{R}^{n_x}, b \in \mathbb{R}$. Which of the following best expresses what we want $\hat{y}$ to tell us? **1 point**

- ○ $\sigma(W\,\mathbf{x})$
- ○ $P(y = \hat{y}|\mathbf{x})$
- ◉ $P(y = 1|\mathbf{x})$
- ○ $\sigma(W\,\mathbf{x} + b$

2. Which of these is the "Logistic Loss"? **1 point**

- ○ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = \mid y^{(i)} - \hat{y}^{(i)} \mid$
- ◉ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = -(y^{(i)} \log(\hat{y}^{(i)}) + (1 - y^{(i)}) \log(1 - \hat{y}^{(i)}))$
- ○ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = \mid y^{(i)} - \hat{y}^{(i)} \mid^2$
- ○ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = max(0, y^{(i)} - \hat{y}^{(i)})$

3. Suppose img is a (32,32,3) array, representing a 32x32 image with 3 color channels red, green and blue. How do you reshape this into a column vector x ? 1 point

- ○ x = img.reshape((32*32,3))
- ○ x = img.reshape((3,32*32))
- ◉ x = img.reshape((32*32*3,1))
- ○ x = img.reshape((1,32*32,3))

4. Consider the following random arrays a and b, and c: 1 point

$a = np.random.randn(3,3)$ # $a.shape = (3,3)$

$b = np.random.randn(2,1)$ # $b.shape = (2,1)$

$c = a + b$

What will be the shape of c?

4. Consider the following random arrays a and b, and c: 1 point

$a = np.random.randn(3,3)\ \#\ a.shape = (3,3)$

$b = np.random.randn(2,1)\ \#\ b.shape = (2,1)$

$c = a + b$

What will be the shape of c?

- (●) The computation cannot happen because it is not possible to broadcast more than one dimension
- ( ) c.shape = (2, 3, 3)
- ( ) c.shape = (2, 1)
- ( ) c.shape = (3,3)

5. Consider the two following random arrays a and b: 1 point

$a = np.random.randn(4,3)\ \#\ a.shape = (4,3)$

$b = np.random.randn(1,3)\ \#\ b.shape = (1,3)$

5. Consider the two following random arrays a and b: 1 point

$a = np.random.randn(4, 3)$ # $a.shape = (4, 3)$

$b = np.random.randn(1, 3)$ # $b.shape = (1, 3)$

$c = a * b$

What will be the shape of c?

- (●) c.shape = (4, 3)
- ( ) c.shape = (1, 3)
- ( ) The computation cannot happen because it is not possible to broadcast more than one dimension.
- ( ) The computation cannot happen because the sizes don't match.

6. Suppose our input batch consists of 8 grayscale images, each of dimension 8x8. We reshape these images into feature column vectors $\mathbf{x}^j$. Remember that $X = \left[\mathbf{x}^{(1)}\mathbf{x}^{(2)} \cdots \mathbf{x}^{(8)}\right]$. What is the dimension of X? 1 point

- ( ) (512, 1)

6. Suppose our input batch consists of 8 grayscale images, each of dimension 8x8. We reshape these images into feature column vectors $\mathbf{x}^j$. Remember that $X = \left[\mathbf{x}^{(1)}\mathbf{x}^{(2)} \cdots \mathbf{x}^{(8)}\right]$. What is the dimension of X? **1 point**

- (512, 1)
- (64, 8)
- (8, 64)
- (8, 8, 8)

7. Consider the following array: **1 point**

$a = np.array([[2, 1], [1, 3]])$

What is the result of $np.dot(a, a)$?

- The computation cannot happen because the sizes don't match. It's going to be an "Error"!
- $\begin{pmatrix} 4 & 1 \\ 1 & 9 \end{pmatrix}$
- $\begin{pmatrix} 4 & 2 \end{pmatrix}$

7. Consider the following array: 1 point

$a = np.array([[2, 1], [1, 3]])$

What is the result of $np.dot(a, a)$?

- ○ The computation cannot happen because the sizes don't match. It's going to be an "Error"!
- ○ $\begin{pmatrix} 4 & 1 \\ 1 & 9 \end{pmatrix}$
- ○ $\begin{pmatrix} 4 & 2 \\ 2 & 6 \end{pmatrix}$
- ◉ $\begin{pmatrix} 5 & 5 \\ 5 & 10 \end{pmatrix}$

8. Consider the following code snippet: 1 point

$a.shape = (3, 4)$

$b.shape = (4, 1)$

8. Consider the following code snippet: 1 point

$a.shape = (3, 4)$

$b.shape = (4, 1)$

for i in range(3):

for j in range(4):

c[i][j] = a[i][j] + b[j]

How do you vectorize this?

- ○ c = a + b
- ○ c = a.T + b
- ◉ c = a + b.T
- ○ c = a.T + b.T

9. Consider the following arrays: 1 point

$a = np.array([[1, 1], [1, -1]])$

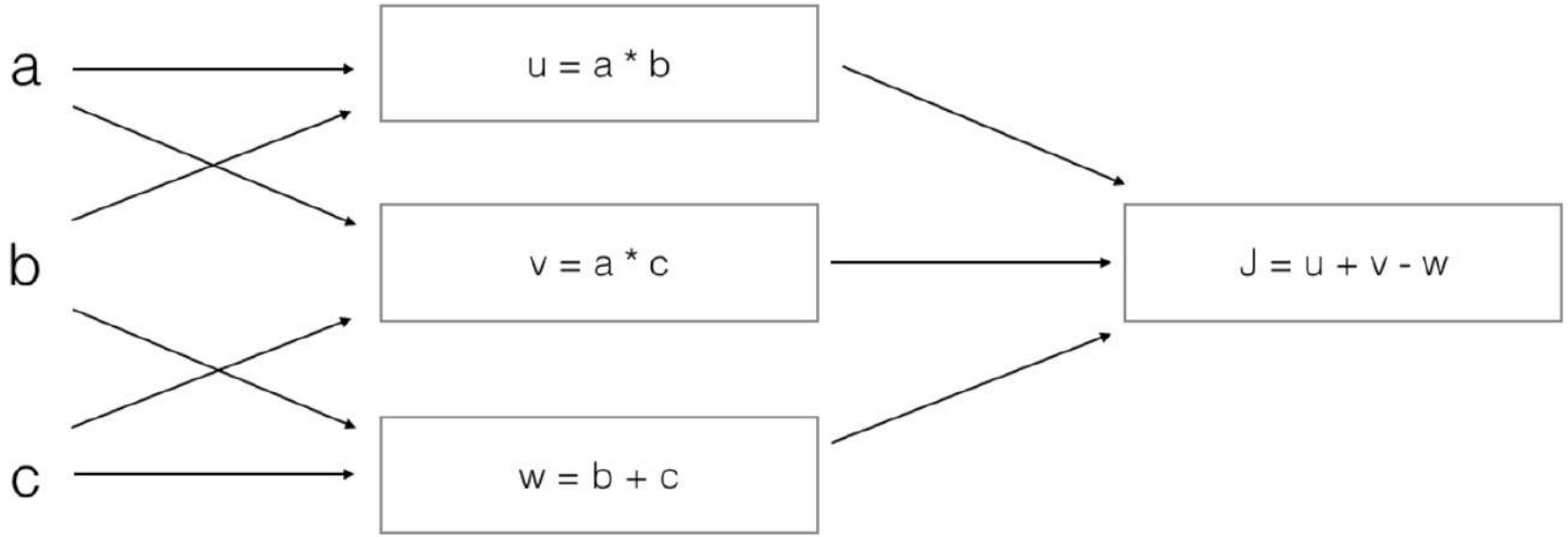
$b = np.array([[2], [3]])$

$c = a + b$

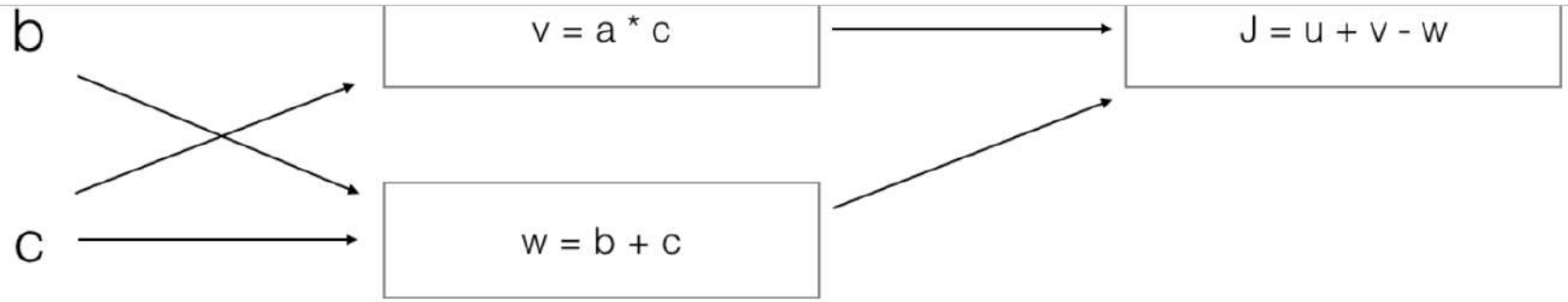
Which of the following arrays is stored in c?

- ○ The computation cannot happen because the sizes don't match. It's going to be an "Error"!
- ○ $\begin{matrix} 3 & 4 \\ 3 & 2 \end{matrix}$
- ◉ $\begin{matrix} 3 & 3 \\ 4 & 2 \end{matrix}$
- ○ $\begin{pmatrix} 3 & 3 \\ 3 & 1 \\ 4 & 4 \\ 5 & 2 \end{pmatrix}$

10. Consider the following computation graph. 1 point



What is the output J?



What is the output J?

- (●) $J = a * b + b * c + a * c$
- ( ) $J = (a - 1) * (b + c)$
- ( ) $J = (b - 1) * (c + a)$
- ( ) $J = (c - 1) * (b + a)$