Congratulations! You passed!

Grade received 90% **Latest Submission Grade** 90% **To pass** 80% or higher

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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 / 1 point**

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

Expand

Correct
Yes. We want the output $\hat{y}$ to tell us the probability that $y = 1$ given x.

2. Suppose that $\hat{y} = 0.9$ and $y = 1$. What is the value of the "Logistic Loss"? Choose the best option. **1 / 1 point**

- ( ) $\mathcal{L}(\hat{y}, y) = -\left(\hat{y}\ \log y + (1 - \hat{y})\ \log(1 - y)\right)$
- ( ) 0.005
- (●) 0.105
- ( ) $+\infty$

Expand

Correct
Yes. Since $\mathcal{L}(\hat{y}, y) = -\big(y\ \log \hat{y} + (1 - y)\ \log(1 - \hat{y})\big)$, for the given values we get $\mathcal{L}(\hat{y}, y) = -(1\ \log 0.9 + 0\ \log 0.1)$

3. Consider the Numpy array x: **1 / 1 point**

$x = np.array([[[1], [2]], [[3], [4]]])$

What is the shape of x?

- ( ) (1, 2, 2)
- ( ) (2, 2)
- (●) (2,2,1)
- ( ) (4,)

Expand

Correct
Yes. This array has two rows and in each row it has 2 arrays of 1x1.

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

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

$b = np.random.randn(1, 4)$ # $b.shape = (1, 4)$

$c = a + b$

What will be the shape of c?

- c.shape = (1, 4)
- The computation cannot happen because it is not possible to broadcast more than one dimension.
- c.shape = (3, 1)
- c.shape = (3, 4)

Expand

Correct
Yes. Broadcasting is used, so row b is copied 3 times so it can be summed to each row of a.

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

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

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

$c = a * b$

What will be the shape of c?

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

Expand

Correct
Yes. Broadcasting allows row a to be multiplied element-wise with each row of b to from c.

6. Suppose you have n_x input features per example. Recall that $X = [x^{(1)}x^{(2)}...x^{(m)}]$. What is the dimension of X? **1 / 1 point**

- (n_x, m)
- $(m, 1)$
- $(1, m)$
- (m, n_x)

Expand

Correct

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

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

What is the result of $a * a$?

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

Expand

Correct
Yes, recall that * indicates element-wise multiplication.

8. Consider the following code snippet: **0 / 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.T
- c = a.T + b.T
- c = a + b
- c = a.T + b

Expand

Incorrect

9. Consider the following arrays: **1 / 1 point**

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

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

$c = a + b$

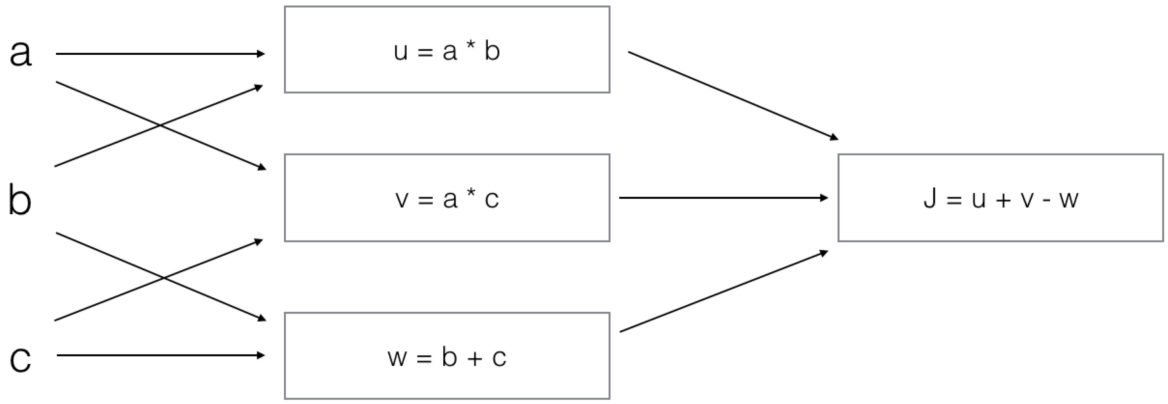
Which of the following arrays is stored in c?

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

Expand

Correct
Yes. The array b is a column vector. This is copied two times and added to the array a to construct the array c.

10. Consider the following computation graph. **1 / 1 point**



What is the output J?

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

Expand

Correct
Yes. $J = u + v - w = a * b + a * c - (b + c) = a * (b + c) - (b + c) = (a - 1) * (b + c)$.