## Congratulations! You passed!

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**1.** In logistic regression given the input $\mathbf{x}$, and parameters $w \in \mathbb{R}^{n_x}, b \in \mathbb{R}$, how do we generate the output $\hat{y}$? 0 / 1 point

- $W\mathbf{x} + b$
- $\sigma(W\mathbf{x})$
- $\sigma(W\mathbf{x} + b)$.
- $\tanh(W\mathbf{x} + b)$

Expand

Incorrect
No. In the convention presented in the lectures we agree on using $$W \mathbf{x} + b $$.

**2.** Suppose that $\hat{y} = 0.5$ and $y = 0$. What is the value of the "Logistic Loss"? Choose the best option. 0 / 1 point

- 0.5
- $\mathcal{L}(\hat{y}, y) = -(y \log \hat{y} + (1-y) \log(1-\hat{y}))$
- $+\infty$
- 0.693

Expand

Incorrect
No. This is the value of the $$L_1$$-loss.

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

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

What is the shape of x?

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

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

$a = np.random.randn(2, 3) \# a.shape = (2, 3)$

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

$c = a + b$

What will be the shape of $c$?

- (selected) c.shape = (2, 3)
- c.shape = (3, 2)
- The computation cannot happen because the sizes don't match. It's going to be "Error"!
- c.shape = (2, 1)

Expand

**Correct**
Yes! This is broadcasting. b (column vector) is copied 3 times so that it can be summed to each column of a.

**5.** Consider the two following random arrays $a$ and $b$: **1 / 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 $c$?

- (selected) c.shape = (4, 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.
- c.shape = (1, 3)

Expand

**Correct**
Yes. Broadcasting is invoked, so row b is multiplied element-wise with each row of a to create 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**

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

Expand

**Correct**

**7.** Recall that $np.dot(a, b)$ performs a matrix multiplication on $a$ and $b$, whereas $a * b$ performs an element-wise multiplication. **1 / 1 point**

Consider the two following random arrays $a$ and $b$:

$a = np.random.randn(12288, 150)$

# $a.shape = (12288, 150)$

$b = np.random.randn(150, 45)$

# $b.shape = (150, 45)$

$c = np.dot(a, b)$

What is the shape of $c$?

- c.shape = (150,150)
- The computation cannot happen because the sizes don't match. It's going to be "Error"!
- c.shape = (12288, 150)
- c.shape = (12288, 45)

Expand

**Correct**
Correct, remember that a np.dot(a, b) has shape (number of rows of a, number of columns of b). The sizes match because: "number of columns of a = 150 = number of rows of b"

**8.** Consider the following code snippet: **1 / 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.T + b
- c = a + b

Expand

**Correct**

**9.** Consider the code snippet: **1 / 1 point**

$a.shape = (3, 3)$

$b.shape = (3, 3)$

$c = a**2 + b.T**2$

Which of the following gives an equivalent output for $c$?

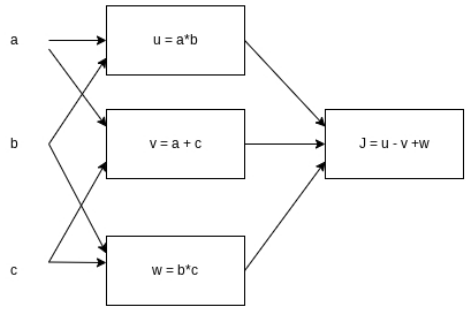
- for i in range(3):
  c[i] = a[i]**2 + b[i]**2
- for i in range(3):
  for j in range(3):
  c[i][j] = a[i][j]**2 + b[j][i]**2
- for i in range(3):
  for j in range(3):
  c[i][j] = a[i][j]**2 + b[i][j]**2
- The computation cannot happen because the sizes don't match. It's going to be an "Error"!

Expand

Correct

Yes. This code squares each entry of a and adds it to the transpose of b square.

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




What is the output of J?

- $(c-1),(a+c)$
- $(a+c),(b-1)$
- $(a-1),(b+c)$
- $ab+bc+ac$

Expand

Correct

Yes. $$J = u - v + w = ab - (a+c) + bc = ab - a + bc - c = a\,(b-1) + c\,(b-1) = (a+c)\,(b-1)$$