## Congratulations! You passed!

Grade received 100% | Latest Submission Grade 100% | To pass 80% or higher

Retake the assignment in **23h 49m**

Go to next item

**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**

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

Expand

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

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

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

Expand

**Correct**
Correct, this is the logistic loss you've seen in lecture!

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

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

What is the shape of x?

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

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

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

$c = a + b$

What will be the shape of $c$?

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

Expand

**Correct**
Yes. It is not possible to broadcast together a and b. In this case there is no way to generate copies of one of the arrays to match the size of the other.

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

Expand

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

**6.** **1 / 1 point**

Suppose you have $n_x$ input features per example. If we decide to use row vectors $\mathbf{x}_j$ for the features and $X = \begin{bmatrix} \mathbf{x}_1 \\ \mathbf{x}_2 \\ \vdots \\ \mathbf{x}_m \end{bmatrix}$.

What is the dimension of $X$?

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

Expand

**Correct**
Yes. Each $\mathbf{x}_j$ has dimension $1 \times n_x$, $X$ is built stacking all rows together into a $m \times n_x$ array.

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

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

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

$a.shape = (4, 3)$

$b.shape = (4, 1)$

for i in range(3):

for j in range(4):

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

How do you vectorize this?

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

Expand

**Correct**
Yes. a[j][i] being used for a[i][j] indicates we are using a.T, and the element in the row j is used in the column j thus we are using b.T.

9. Consider the following code: 1 / 1 point

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

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

$c = a * b$

What will be $c$? (If you're not sure, feel free to run this in python to find out).

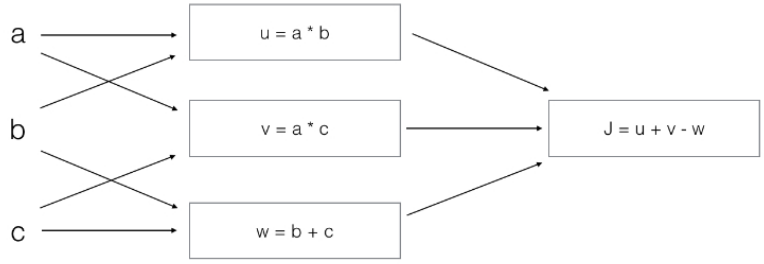
- It will lead to an error since you cannot use "*" to operate on these two matrices. You need to instead use np.dot(a,b)

- This will multiply a 3x3 matrix a with a 3x1 vector, thus resulting in a 3x1 vector. That is, c.shape = (3,1).
- This will invoke broadcasting, so b is copied three times to become (3, 3), and $*$ invokes a matrix multiplication operation of two 3x3 matrices so c.shape will be (3, 3)
- This will invoke broadcasting, so b is copied three times to become (3,3), and $*$ is an element-wise product so c.shape will be (3, 3)

Expand

Correct

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




What is the output J?

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

Expand

Correct

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