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? **0 / 1 point**

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

Expand

Incorrect
No. We want the output $\hat{y}$ to tell us the probability that $y=1$ given x.

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

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

Expand

Correct
Yes. Given the values of $\hat{y}$ and y we get $\mathcal{L}(0.5,0) = -(0\log 0.5 + 1\log(0.5)) \approx 0.693$.

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 / 1 point**

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

Expand

Correct

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

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

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

$c = a * b$

What will be the shape of c?

- 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 = (4, 3)

Expand

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

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

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. Consider the following array: 1 / 1 point

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

What is the result of $a * a$?

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

Expand

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

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

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?

- The computation cannot happen because the sizes don't match. It's going to be an "Error"!

for i in range(3):
for j in range(3):
c[i][j] = a[i][j]**2 + b[i][j]**2

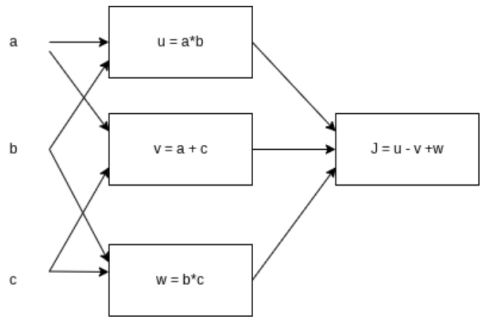
for i in range(3):
for j in range(3):
c[i][j] = a[i][j]**2 + b[j][i]**2

for i in range(3):
c[i] = a[i]**2 + b[i]**2

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?

$(c-1)(a+c)$

$ab+bc+ac$

$(a-1)(b+c)$

$(a+c)(b-1)$

Expand

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