← Back **Neural Network Basics**
Graded Assignment • 50 min

Due Nov 17, 11:59 PM IST

1. What does a neuron compute? 1 point

○ A neuron computes an activation function followed by a linear function $z = Wx + b$

○ A neuron computes the mean of all features before applying the output to an activation function

● A neuron computes a linear function $z = Wx + b$ followed by an activation function

○ A neuron computes a function g that scales the input x linearly (Wx + b)

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

○ $+\infty$

○ $\mathcal{L}(\hat{y}, y) = -\left(y \ \log \hat{y} + (1 - y) \ \log(1 - \hat{y})\right)$

○ 0.5

● 0.693

3. Consider the Numpy array x: 1 point

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

What is the shape of x?

○ (4,)

○ (2, 2)

○ (1, 2, 2)

● (2,2,1)

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

○ c.shape = (3, 1)

○ The computation cannot happen because it is not possible to broadcast more than one dimension.

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

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

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

$c = a * b$

What will be the shape of c?

○ c.shape = (4, 3)

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

○ c.shape = (4,2)

○ c.shape = (3, 3)

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 point

○ (m, n_x)

○ $(1, m)$

● (n_x, m)

○ $(m, 1)$

7. Consider the following array: 1 point

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

What is the result of $a * a$?

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

● $\begin{pmatrix} 4 & 1 \\ 1 & 9 \end{pmatrix}$

○ $\begin{pmatrix} 5 & 5 \\ 5 & 10 \end{pmatrix}$

○ $\begin{pmatrix} 4 & 2 \\ 2 & 6 \end{pmatrix}$

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.T

○ c = a + b

○ c = a + b

○ c = a.T + b.T

○ c = a.T + b

9. Consider the code snippet:

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

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

○

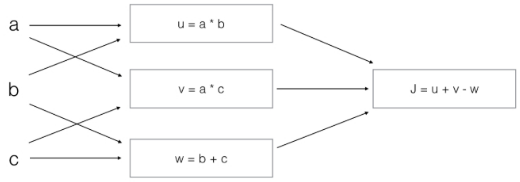
```
for i in range(3):
 c[i] = a[i]**2 + b[i]**2
```

○

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

10. Consider the following computation graph.

1 point



What is the output J?

● $J = (a - 1) * (b + c)$

○ $J = (b - 1) * (c + a)$

○ $J = a * b + b * c + a * c$

○ $J = (c - 1) * (b + a)$