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CALIFICACIÓN
80 %

Neural Network Basics

CALIFICACIÓN DEL ÚLTIMO ENVÍO
80%

1. What does a neuron compute? — **0 / 1 punto**

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

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

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

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

   ✗ **Incorrecto**
   No. There is also an activation function in a neuron, right after the linearity (Wx + b).

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

   ○ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = max(0, y^{(i)} - \hat{y}^{(i)})$

   ○ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = |\, y^{(i)} - \hat{y}^{(i)} \,|^2$

   ◉ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = -(y^{(i)} \log(\hat{y}^{(i)}) + (1 - y^{(i)}) \log(1 - \hat{y}^{(i)}))$

   ○ $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = |\, y^{(i)} - \hat{y}^{(i)} \,|$

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

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? — **1 / 1 punto**

   ○ x = img.reshape((32*32,3))

   ○ x = img.reshape((1,32*32,*3))

   ◉ x = img.reshape((32*32*3,1))

   ○ x = img.reshape((3,32*32))

   ✓ **Correcto**

4. Consider the two following random arrays "a" and "b": — **1 / 1 punto**

```
1    a = np.random.randn(2, 3) # a.shape = (2, 3)
2    b = np.random.randn(2, 1) # b.shape = (2, 1)
3    c = a + b
```

   What will be the shape of "c"?

   ○ c.shape = (2, 1)

   ◉ c.shape = (2, 3)

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

   ○ c.shape = (3, 2)

   ✓ **Correcto**
   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 punto**

```
1    a = np.random.randn(4, 3) # a.shape = (4, 3)
2    b = np.random.randn(3, 2) # b.shape = (3, 2)
3    c = a*b
```

   What will be the shape of "c"?

○ c.shape = (4,2)

○ c.shape = (3, 3)

○ c.shape = (4, 3)

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

✓ Correcto

Indeed! In numpy the "*" operator indicates element-wise multiplication. It is different from "np.dot()". If you would try "c = np.dot(a,b)" you would get c.shape = (4, 2).

Challenge yourself!

About **41%** of learners didn't pass this exam on their first try. But don't worry, you can always try again!

¿Te resultó útil? Sí No

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?   **0 / 1 punto**

○ $(m, 1)$

○ $(1, m)$

⦿ (m, n_x)

○ (n_x, m)

✗ **Incorrecto**

---

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 punto**

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

Challenge yourself!

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¿Te resultó útil? Sí No

```
1    a = np.random.randn(12288, 150) # a.shape = (12288, 150)
2    b = np.random.randn(150, 45) # b.shape = (150, 45)
3    c = np.dot(a,b)
```

What is the shape of c?

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

⦿ c.shape = (12288, 45)

○ c.shape = (12288, 150)

○ c.shape = (150,150)

✓ **Correcto**

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 punto**

Challenge yourself!

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¿Te resultó útil? Sí No

```
1    # a.shape = (3,4)
2    # b.shape = (4,1)
3
4    for i in range(3):
5        for j in range(4):
6            c[i][j] = a[i][j] + b[j]
```

How do you vectorize this?

○ c = a.T + b

○ c = a.T + b.T

○ c = a + b

⦿ c = a + b.T

✓ **Correcto**

---

9. Consider the following code: **1 / 1 punto**

Challenge yourself!

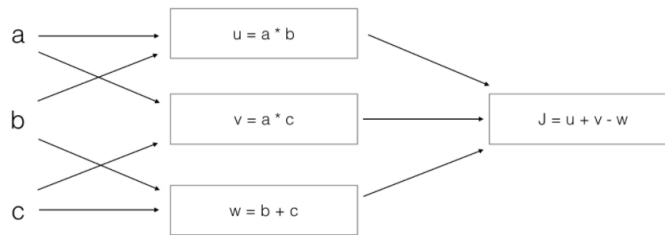About **41%** of learners didn't pass this exam on their first try. But don't worry, you can always try again!

¿Te resultó útil? Sí No

```
1    a = np.random.randn(3, 3)
2    b = np.random.randn(3, 1)
3    c = a*b
```

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

⦿ 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)

○ 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 multiply a 3x3 matrix a with a 3x1 vector, thus resulting in a 3x1 vector. That is, c.shape = (3,1).

○ 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)

✓ Correcto

10. Consider the following computation graph.

1 / 1 punto

What is the output J?

○ J = (c - 1)*(b + a)

◉ J = (a - 1) * (b + c)

○ J = a*b + b*c + a*c

○ J = (b - 1) * (c + a)

✓ Correcto

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