Try again once you are ready

Grade received 60% **Latest Submission Grade** 50% **To pass** 80% or higher

Retake the assignment in **23h 48m**

1. What does a neuron compute? **1 / 1 point**

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

Expand

Correct
Correct, we generally say that the output of a neuron is a = g(Wx + b) where g is the activation function (sigmoid, tanh, ReLU, ...).

2. Suppose that $\hat{y} = 0.9$ and $y = 1$. What is the value of the "Logistic Loss"? Choose the best option. **0 / 1 point**

- 0.105
- $\mathcal{L}(\hat{y}, y) = -(\hat{y} \log y + (1 - \hat{y}) \log(1 - y))$

- $+\infty$
- 0.005

Expand

Incorrect
No. This is not the definition of the Logistic Loss function.

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

Expand

Correct

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?

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

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: **0 / 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?

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

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.

Expand

Incorrect
No. It is possible to do broadcasting, multiplying the row a element-wise with each row of b to form c.

6. Suppose our input batch consists of 8 grayscale images, each of dimension 8x8. We reshape these images into feature column vectors $\mathbf{x}^j$. Remember that $X = \left[\mathbf{x}^{(1)}\mathbf{x}^{(2)} \cdots \mathbf{x}^{(8)}\right]$. What is the dimension of X? **1 / 1 point**

- (64, 8)
- (8, 64)
- (512, 1)
- (8, 8, 8)

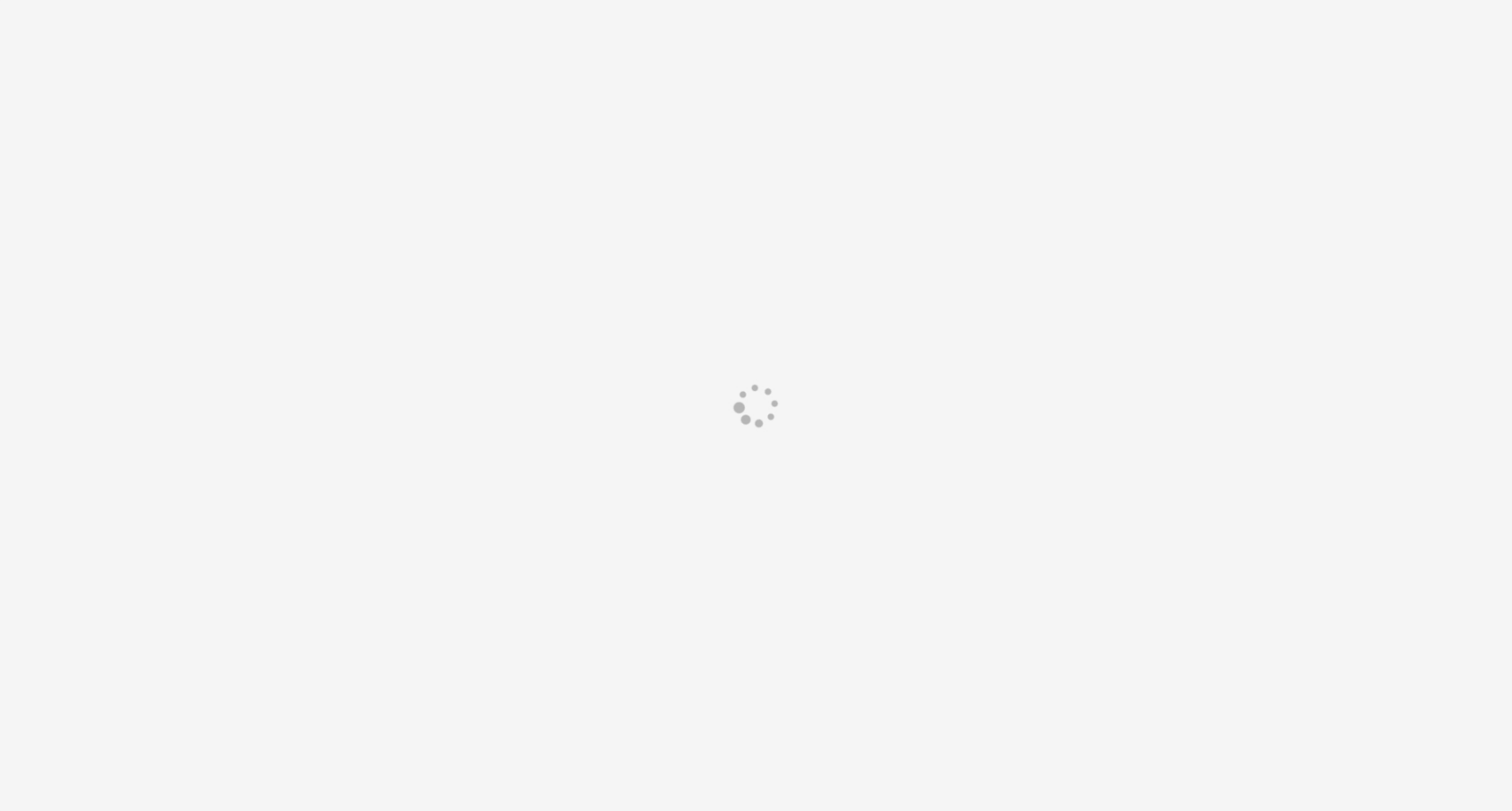
Expand

Correct
Yes. After converting the 8x8 gray scale images to a column vector we get a vector of size 64, thus X has dimension $(64, 8)$.

7. Consider the following array: **0 / 1 point**

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

What is the result of $np.dot(a, a)$?



Expand

Incorrect

No, recall that * indicates the element-wise multiplication and that np.dot() is the matrix multiplication.

8. Consider the following code snippet:

0 / 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
- c = a + b.T
- c = a.T + b.T
- c = a + b

Expand

Incorrect
No. The a[j][i] being assigned to a[i][j] indicates that we are using a.T.

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

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

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

$c = a * b$

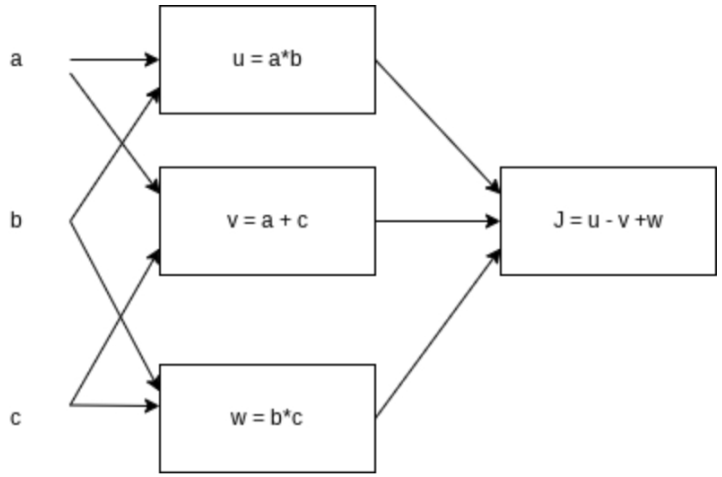
What will be c? (If you're not sure, feel free to run this in python to find out).

- 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 $*$ is an element-wise product so c.shape will be (3, 3)
- 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 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)

Expand

Correct

10. Consider the following computational graph. **0 / 1 point**



What is the output of J?

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

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

Expand

Incorrect

No. $J = u - v + w = ab - (a + c) + bc = ab - a + bc - c = a(b - 1) + c(b - 1) = (a + c)(b - 1)$