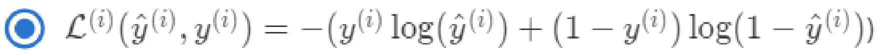
1. **What does a neuron compute?**

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

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

   - Answer :

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

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?**

   - Answer :

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

4. **Consider the two following random arrays a and b**

   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?

   - Answer : c.shape = (2, 3)

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

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

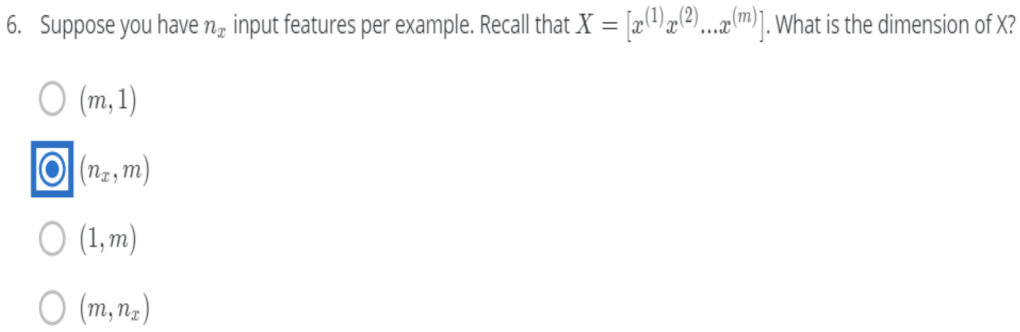
   b = np.random.randn(3, 2) # b.shape = (3, 2)

   c = a*b

   What will be the shape of c?

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

6.



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?

○ $(m, 1)$

● (n_x, m)

○ $(1, m)$

○ (m, n_x)

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

   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?

   - Answer : c.shape = (12288, 45)

8. **Consider the following code snippet:**

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

   How do you vectorize this?

   - Answer : c = a+ b.T

9. **Consider the following code:**

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

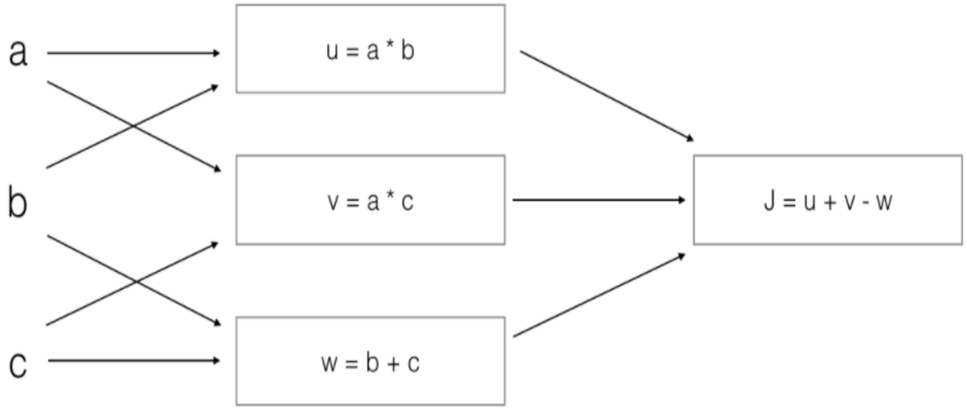
   b = np.random.randn(3, 1)

   c = a*b

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

   - Answer : 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)

10. Consider the following computation graph.



What is the output J?

- Answer : J = (a - 1) * (b + c)