Note: In here I am adding True or False, it can be Right or Wrong both first Check If option is right or wrong under that question summary. And Rest question which I am giving multiple answer question or single choice question both are only right answers, and there is lot's of changing questions are there so please check all the question first and then only select the correct option.

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

Expand

Correct

4. Consider the following random arrays a and b, and c: **1 / 1 point**

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

$b = np.random.randn(2,1)$ # $b.shape = (2,1)$

$c = a + b$

What will be the shape of c?

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

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: 1 / 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?

- (●) The computation cannot happen because the sizes don't match. It's going to be "Error"!
- ( ) c.shape = (3, 3)
- ( ) c.shape = (4,2)
- ( ) c.shape = (4, 3)

Expand

Correct
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).

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 / 1 point

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

Expand

Correct

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 point**

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?

- The computation cannot happen because the sizes don't match. It's going to be "Error"!
- c.shape = (12288, 150)
- c.shape = (150,150)
- c.shape = (12288, 45)

Expand

Correct
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"

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 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 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 $*$ invokes a matrix multiplication operation of two 3x3 matrices 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)

Expand

Correct

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**

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

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 x is a (8, 1) array. Which of the following is a valid reshape? **1 / 1 point**

- x.reshape(-1, 3)
- x.reshape(1, 4, 3)
- x.reshape(2, 2, 2)
- x.reshape(2, 4, 4)

Expand

Correct
Yes. This generates uses 2*2*2 = 8 entries.

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 = (3, 1)
- ○ The computation cannot happen because it is not possible to broadcast more than one dimension.
- ◉ c.shape = (3, 4)
- ○ c.shape = (1, 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**

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

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

$c = a * b$

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"!

Expand

✓ **Correct**
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).

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 / 1 point**

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

Expand

✓ Correct

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

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

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

- $\begin{pmatrix} 4 & 2 \\ 2 & 6 \end{pmatrix}$
- $\begin{pmatrix} 4 & 1 \\ 1 & 9 \end{pmatrix}$
- 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 the element wise multiplication and that np.dot() is the matrix multiplication.

Thus $\begin{pmatrix} (2)(2)+(1)(1) & (2)(1)+(1)(3) \\ (1)(2)+(3)(1) & (1)(1)+(3)(3) \end{pmatrix}$.

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

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

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

$c = a * b$

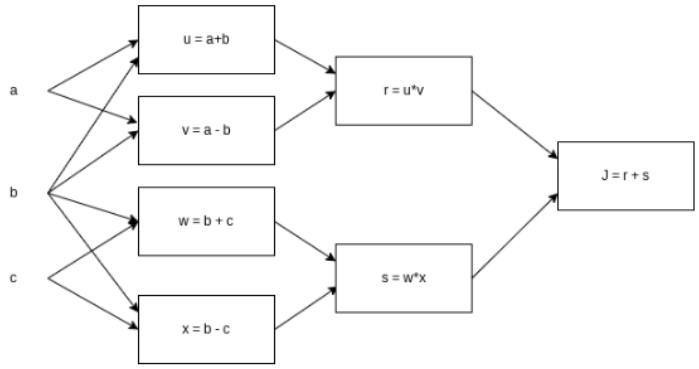
What will be *c*? (If you're not sure, feel free to run this in python to find out).

- 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)
- 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)
- 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)

Expand

Correct

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



What is the output of J?

- $a^2 - c^2$
- $(a - b) * (a - c)$
- $a^2 - b^2$
- $a^2 + b^2 - c^2$

Expand

Correct

Yes.

$J = r + s = u * v + w * x = (a + b) * (a - b) + (b + c) * (b - c) = a^2 - b^2 + b^2 - c^2 = a^2 - c^2$

.

Final Attempt:

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**

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

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 x is a (8, 1) array. Which of the following is a valid reshape? **1 / 1 point**

- x.reshape(-1, 3)
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- x.reshape(2, 4, 4)

Expand

Correct
Yes. This generates uses 2*2*2 = 8 entries.

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 = (3, 1)
- ○ The computation cannot happen because it is not possible to broadcast more than one dimension.
- ◉ c.shape = (3, 4)
- ○ c.shape = (1, 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**

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

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$$c = a * b$$

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"!

Expand

Correct
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).

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 / 1 point**

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

Expand

Correct

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

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

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

- $\begin{pmatrix} 2 & 6 \end{pmatrix}$
- $\begin{pmatrix} 4 & 1 \\ 1 & 9 \end{pmatrix}$
- The computation cannot happen because the sizes don't match. It's going to be an "Error"!
- $\begin{pmatrix} 5 & 5 \\ 5 & 10 \end{pmatrix}$

Expand

Correct

Yes, recall that * indicates the element wise multiplication and that np.dot() is the matrix multiplication.

Thus $\begin{pmatrix} (2)(2)+(1)(1) & (2)(1)+(1)(3) \\ (1)(2)+(3)(1) & (1)(1)+(3)(3) \end{pmatrix}$.

9. Consider the following code: 1 / 1 poin

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Expand

Correct

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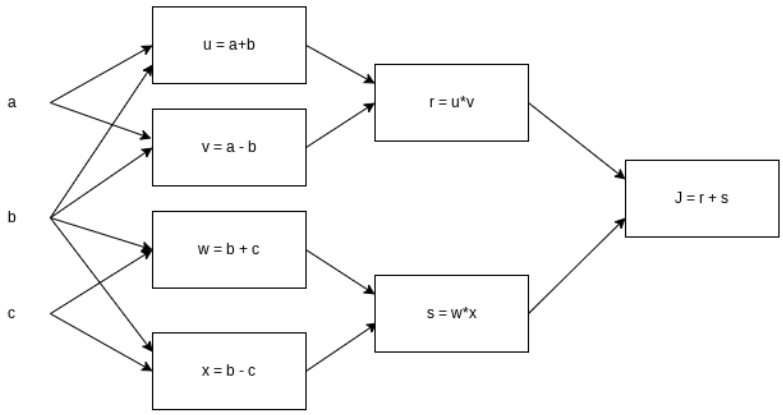
1 / 1 point



What is the output of J?

- $a^2 - c^2$
- $(a - b) * (a - c)$
- $a^2 - b^2$
- $a^2 + b^2 - c^2$

Expand

Correct

Yes.

$J = r + s = u * v + w * x = (a + b) * (a - b) + (b + c) * (b - c) = a^2 - b^2 + b^2 - c^2 = a^2 - c^2$

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