Key Concepts on Deep Neural Networks

1.

Question 1

What is stored in the 'cache' during forward propagation for latter use in backward propagation?

1 / 1 point

Expand

Correct

Yes. This value is useful in the calculation of dW^{[l]}$dW^{[l]}$ in the backward propagation.

2.

Question 2

Which of the following are “parameters” of a neural network? (Check all that apply.)

1 / 1 point

Expand

Correct

Great, you got all the right answers.

3.

Question 3

Which of the following statements is true?

1 / 1 point

Expand

Correct

4.

Question 4

We can not use vectorization to calculate da^{[l]}$da^{[l]}$ in backpropagation, we must use a for loop over all the examples. True/False?

1 / 1 point

Expand

Correct

Correct. We can use vectorization in backpropagation to calculate dA^{[l]}$dA^{[l]}$ for each layer. This computation is done over all the training examples.

5.

Question 5

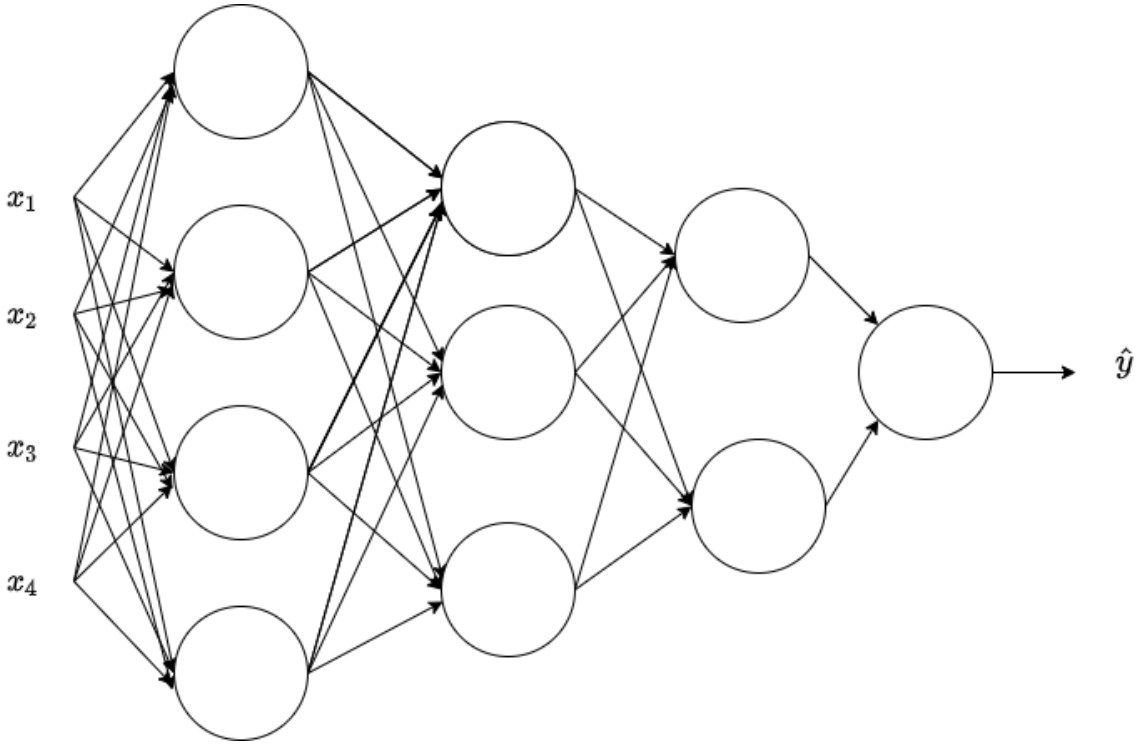
Assume we store the values for n^{[l]}$n^{[l]}$ in an array called layer_dims, as follows: layer_dims = [n_xnn_xn,4,3,2,1]. So layer 1 has four hidden units, layer 2 has 3 hidden units, and so on. Which of the following for-loops will allow you to initialize the parameters for the model?

0 / 1 point

Expand

Incorrect
No. This exceeds the number of layers on the neural network.

6.
Question 6
Consider the following neural network:



What are all the values of n^{[0]}$n_{[0]}$, n^{[1]}$n_{[1]}$, n^{[2]}$n_{[2]}$, n^{[3]}$n_{[3]}$ and n^{[4]}$n_{[4]}$?

1 / 1 point
Expand

Correct
Yes. The n^{[l]}$n_{[l]}$ are the number of units in each layer, notice that n^{[0]} = n_x$n_{[0]}=n_x$.

7.
Question 7
During forward propagation, for the value of A^{[l]}$A_{[l]}$ the value is used of Z^{[l]}$Z_{[l]}$ with the activation function g^{[l]}$g_{[l]}$. During backward propagation we calculate dA^{[l]}$dA_{[l]}$ from Z^{[l]}$Z_{[l]}$.

0 / 1 point
Expand

Incorrect
Incorrect. Correct. During backward propagation we are interested in computing dW^{[l]}$dW_{[l]}$ and db^{[l]}$db_{[l]}$. For that we use g'^{L}g'_L, dZ^{[l]}$dZ_{[l]}$, Z^{[l]}$Z_{[l]}$, and W^{[l]}$W_{[l]}$.

8.
Question 8
A shallow neural network with a single hidden layer and 6 hidden units can compute any function that a neural network with 2 hidden layers and 6 hidden units can compute. True/False?

1 / 1 point

Expand

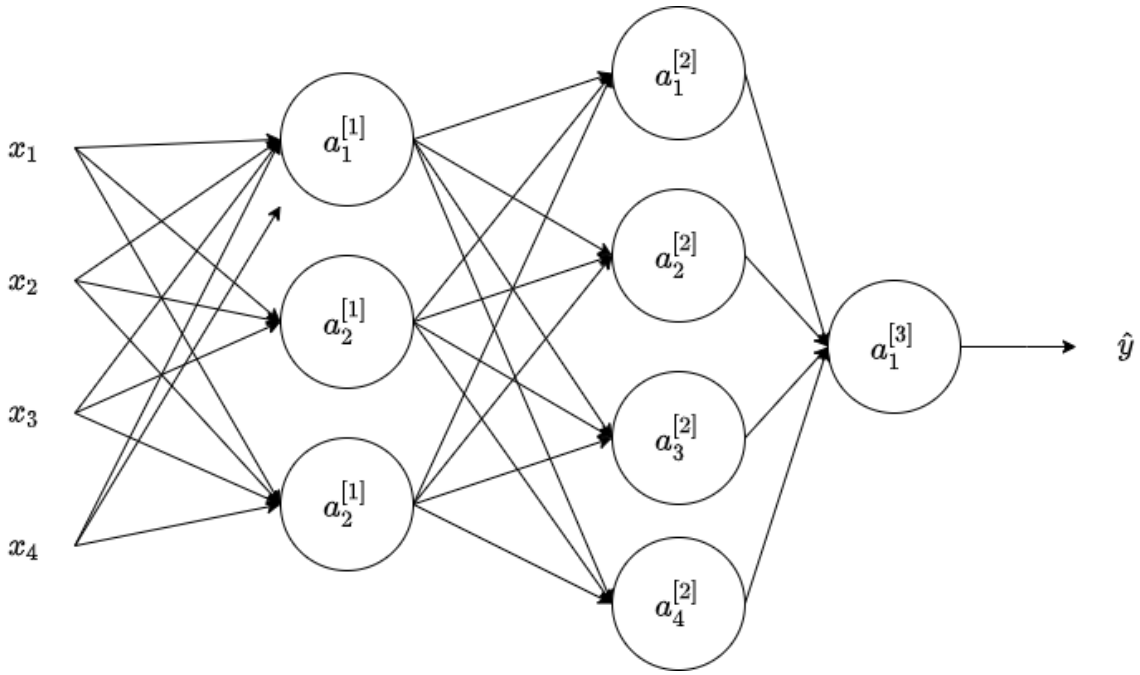
Correct

Correct. As seen during the lectures there are functions you can compute with a "small" L-layer deep neural network that shallower networks require exponentially more hidden units to compute.

9.

Question 9

Consider the following 2 hidden layers neural network:



Which of the following statements are true? (Check all that apply).

1 / 1 point

Expand

Correct

Great, you got all the right answers.

10.

Question 10

In the general case if we are training with $\mathrm{m}m$ examples what is the shape of $\mathrm{A}\hat{}\{[\mathrm{l}]\}A^{[l]}$?

1 / 1 point

Expand

Correct

Yes. The number of rows in $\mathrm{A}\hat{}\{[1]\}A^{[1]}$ corresponds to the number of units in the l-th layer.

1.

Question 1

What is stored in the 'cache' during forward propagation for latter use in backward propagation?

1 / 1 point

Expand

Correct
Yes. This value is useful in the calculation of dW^{[l]}$dW_{[l]}$ in the backward propagation.

2.
Question 2
During the backpropagation process, we use gradient descent to change the hyperparameters. True/False?

0 / 1 point
Expand

Incorrect
Incorrect. During backpropagation, we use gradient descent to compute new values of W^{[l]}$W_{[l]}$ and b^{[l]}$b_{[l]}$. These are the parameters of the network.

3.
Question 3
Which of the following statements is true?

1 / 1 point
Expand

Correct

4.
Question 4
Vectorization allows you to compute forward propagation in an LL-layer neural network without an explicit for-loop (or any other explicit iterative loop) over the layers l=1, 2, …,L. True/False?

1 / 1 point
Expand

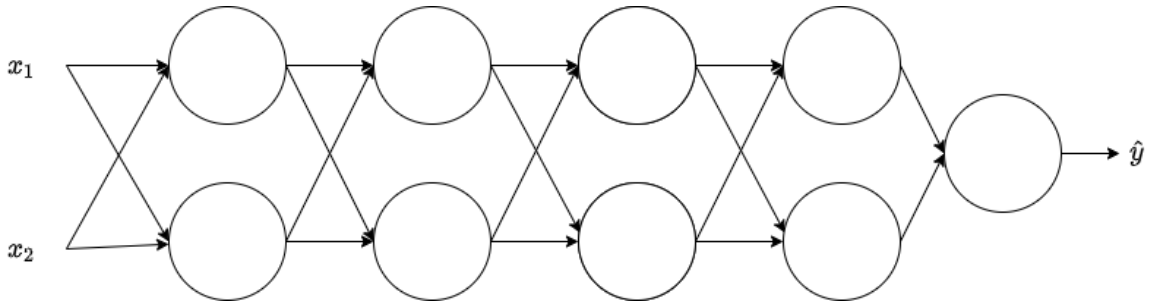
Correct
Forward propagation propagates the input through the layers, although for shallow networks we may just write all the lines (a^{[2]} = g^{[2]}(z^{[2]})$a_{[2]}=g_{[2]}(z_{[2]})$, z^{[2]}= W^{[2]}a^{[1]}+b^{[2]}$z_{[2]}=W_{[2]}a_{[1]}+b_{[2]}$, ...) in a deeper network, we cannot avoid a for loop iterating over the layers: (a^{[l]} = g^{[l]}(z^{[l]})$a_{[l]}=g_{[l]}(z_{[l]})$, z^{[l]} = W^{[l]}a^{[l-1]} + b^{[l]}$z_{[l]}=W_{[l]}a_{[l-1]}+b_{[l]}$, ...).

5.
Question 5
Suppose W[i] is the array with the weights of the i-th layer, b[i] is the vector of biases of the i-th layer, and g is the activation layer used in all layers. Which of the following calculates the forward propagation for the neural network with L layers.

1 / 1 point
Expand

Correct
Yes. Remember that the range omits the last number thus the range from 1 to L+1 gives the L necessary values.

6.
Question 6
Consider the following neural network:



How many layers does this network have?

1 / 1 point

Expand

Correct

Yes. The number of layers is the number of hidden layers + 1.

7.

Question 7

If L is the number of layers of a neural network then dZ^{[L]} = A^{[L]} - Y$dZ^{[L]} = A^{[L]} - Y$. True/False?

1 / 1 point

Expand

Correct

8.

Question 8

A shallow neural network with a single hidden layer and 6 hidden units can compute any function that a neural network with 2 hidden layers and 6 hidden units can compute. True/False?

1 / 1 point

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Correct

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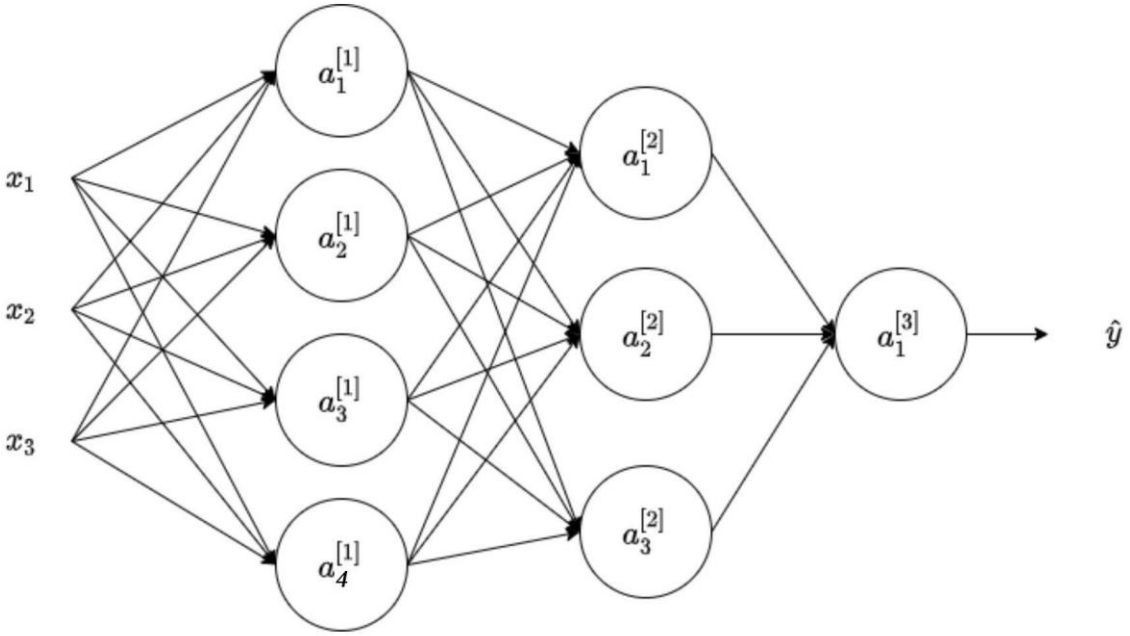
Consider the following 2 hidden layers neural network:



Which of the following statements is true? (Check all that apply).

1 / 1 point

Expand

Correct

Great, you got all the right answers.

10.

Question 10

Whereas the previous question used a specific network, in the general case what is the dimension of W^{[l]}, the weight matrix associated with layer l?

1 / 1 point

Expand

Correct

True