Congratulations! You passed!

Grade received 90% **Latest Submission Grade** 90% **To pass** 80% or higher

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1. What is the "cache" used for in our implementation of forward propagation and backward propagation? 1 / 1 point

- (selected) We use it to pass Z computed during forward propagation to the corresponding backward propagation step. It contains useful values for backward propagation to compute derivatives.
- It is used to cache the intermediate values of the cost function during training.
- It is used to keep track of the hyperparameters that we are searching over, to speed up computation.
- We use it to pass variables computed during backward propagation to the corresponding forward propagation step. It contains useful values for forward propagation to compute activations.

Expand

Correct
Correct, the "cache" records values from the forward propagation units and are used in backward propagation units because it is needed to compute the chain rule derivatives.

2. During the backpropagation process, we use gradient descent to change the hyperparameters. True/False? 1 / 1 point

- (selected) False
- True

Expand

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

3. Considering the intermediate results below, which layers of a deep neural network are they likely to belong to? 1 / 1 point

- Input layer of the deep neural network.
- Later layers of the deep neural network.
- Middle layers of the deep neural network.
- Early layers of the deep neural network.

Expand

Correct
Correct. The deep layers of a neural network are typically computing more complex features such as the ones shown in the figure.

4. Vectorization allows you to compute forward propagation in an L-layer neural network without an explicit for-loop (or any other explicit iterative loop) over the layers l=1, 2, …,L. True/False? **0 / 1 point**

- False
- True

Expand

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

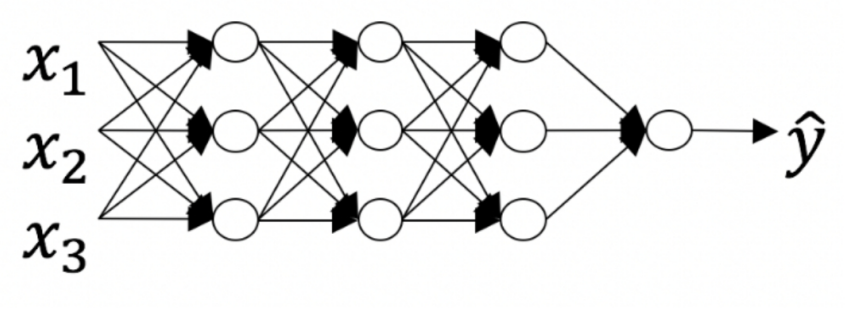
5. Suppose W[i] is the array with the weights of the i-th layer, b[i] is the vector of biases of the i-th layer, and g is the activation function used in all layers. Which of the following calculates the forward propagation for the neural network with L layers. **1 / 1 point**

- for i in range(1, L+1):
  Z[i] = W[i]*A[i-1] + b[i]
  A[i] = g(Z[i])
- for i in range(L):
  Z[i] = W[i]*X + b[i]
  A[i] = g(Z[i])
- for i in range(1, L):
  Z[i] = W[i]*A[i-1] + b[i]
  A[i] = g(Z[i])
- for i in range(L):
  Z[i+1] = W[i+1]*A[i+1] + b[i+1]
  A[i+1] = g(Z[i+1])

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. Consider the following neural network. **1 / 1 point**



How many layers does this network have?

- The number of layers L is 4. The number of hidden layers is 3.
- The number of layers L is 5. The number of hidden layers is 4.
- The number of layers L is 4. The number of hidden layers is 4.
- The number of layers L is 3. The number of hidden layers is 3.

Expand

Correct
Yes. As seen in lecture, the number of layers is counted as the number of hidden layers + 1. The input and output layers are not counted as hidden layers.

7. If L is the number of layers of a neural network then $dZ^{[L]} = A^{[L]} - Y$. True/False? **1 / 1 point**

- False
- True

Expand

Correct
Correct. The gradient of the output layer depends on the difference between the value computed during the forward propagation process and the target values.

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**

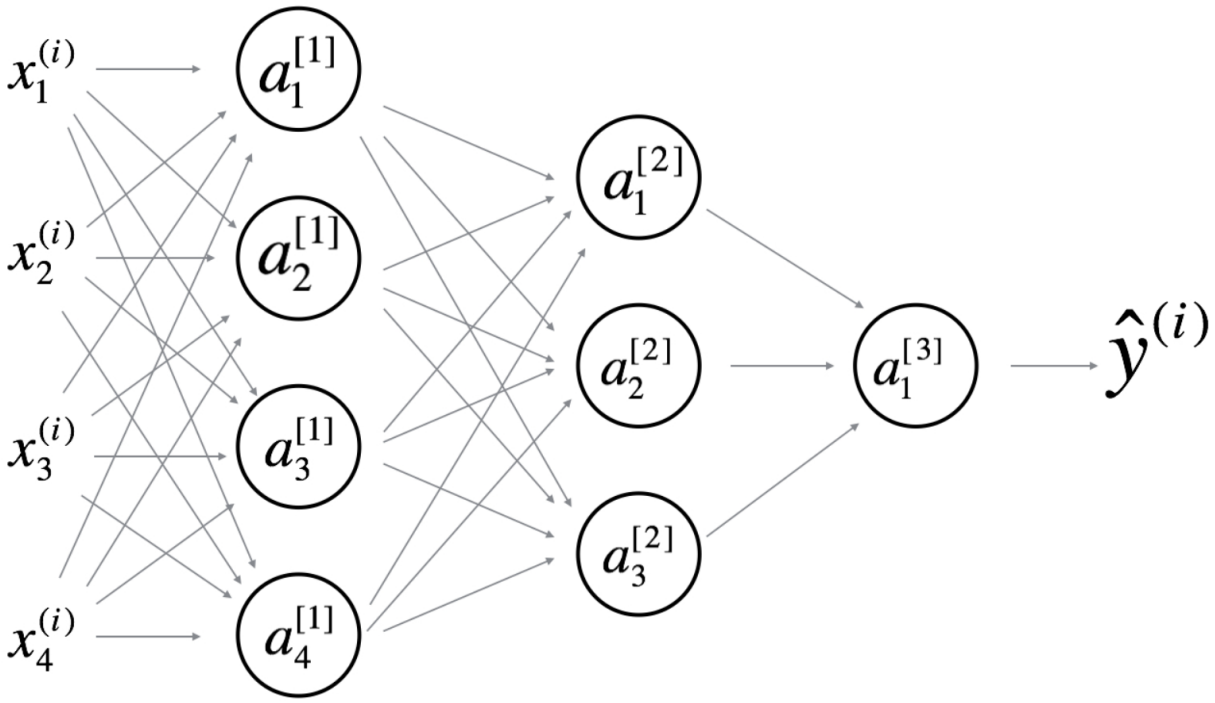
- False
- True

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. Consider the following 2 hidden layer neural network:

1 / 1 point



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

- [x] $W^{[2]}$ will have shape (3, 4)

  ✓ **Correct**
  Yes. More generally, the shape of $W^{[l]}$ is $(n^{[l]}, n^{[l-1]})$.

- [ ] $b^{[2]}$ will have shape (1, 1)
- [x] $b^{[3]}$ will have shape (1, 1)

  ✓ **Correct**
  Yes. More generally, the shape of $b^{[l]}$ is $(n^{[l]}, 1)$.

- [x] $W^{[1]}$ will have shape (4, 4)

  ✓ **Correct**
  Yes. More generally, the shape of $W^{[l]}$ is $(n^{[l]}, n^{[l-1]})$.

- [ ] $b^{[1]}$ will have shape (3, 1)
- [ ] $W^{[3]}$ will have shape (3, 1)
- [x] $$b^{[2]}$$ will have shape (3, 1)

  ✓ **Correct**
  Yes. More generally, the shape of $$b^{[l]}$$ is $$(n^{[l]}, 1)$$.

- [x] $$b^{[1]}$$ will have shape (4, 1)

  ✓ **Correct**
  Yes. More generally, the shape of $$b^{[l]}$$ is $$(n^{[l]}, 1)$$.

- [ ] $$W^{[1]}$$ will have shape (3, 4)
- [ ] $$W^{[2]}$$ will have shape (3, 1)
- [ ] $$b^{[3]}$$ will have shape (3, 1)
- [x] $$W^{[3]}$$ will have shape (1, 3)

Correct

Yes. More generally, the shape of $$W^{[l]}$$ is $$(n^{[l]}, n^{[l-1]})$$.

Expand

Correct

Great, you got all the right answers.

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

- $W^{[l]}$ has shape $(n^{[l+1]}, n^{[l]})$
- $W^{[l]}$ has shape $(n^{[l-1]}, n^{[l]})$
- $W^{[l]}$ has shape $(n^{[l]}, n^{[l+1]})$
- $W^{[l]}$ has shape $(n^{[l]}, n^{[l-1]})$

Expand

Correct

True