Try again once you are ready

Grade received 60% | Latest Submission Grade 60% | To pass 80% or higher

Try again

1. Which of the following do you typically see in ConvNet? 1 / 1 point

- (•) Use of FC layers after flattening the volume to generate output classes.
- ( ) ConvNet makes exclusive use of CONV layers.
- ( ) Use of multiple POOL layers followed by a CONV layer.
- ( ) Multiple FC layers followed by a CONV layer.

Expand

Correct
Yes, FC layers are typically used in the last few layers after flattening the volume to generate the output in classification.

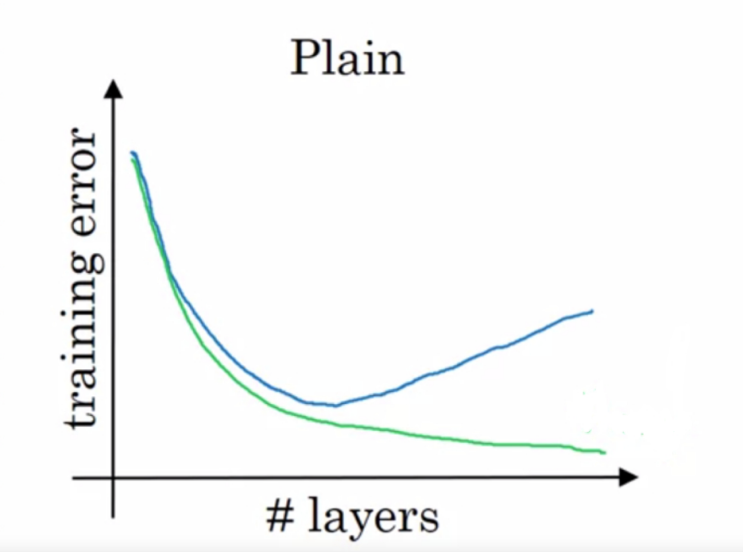
2. In order to be able to build very deep networks, we usually only use pooling layers to downsize the height/width of the activation volumes while convolutions are used with "valid" padding. Otherwise, we would downsize the input of the model too quickly. 1 / 1 point

- ( ) True
- (•) False

Expand

Correct
Correct!

3. Based on the lectures, in the following picture, which curve corresponds to the expected behavior in theory, and which one corresponds to the behavior we get in practice? This when using plain neural networks. 1 / 1 point



- The blue one depicts the theory, and the green one the reality.
- The green one depicts the results in theory, and also in practice.
- The blue one depicts the results in theory, and also in practice.
- (selected) The green one depicts the results in theory, and the blue one the reality.

Expand

Correct
Yes, in theory, we expect that as we increase the number of layers the training error decreases; but in practice after a certain number of layers the error increases.

4. The computation of a ResNet block is expressed in the equation: **1 / 1 point**

$$a^{[l+2]} = g\left(W^{[l+2]}\, g\left(W^{[l+1]}\, a^{[l]} + b^{[l+1]}\right) + b^{[l+2]} + a^{[l]}\right)$$

C A B

Which part corresponds to the skip connection?

- The term in the red box, marked as C.
- (selected) The term in the orange box, marked as B.
- The equation of ResNet.
- The term in the blue box, marked as A.

Expand

Correct
Yes, this term is the result of the skip connection or shortcut.

5. Which ones of the following statements on Residual Networks are true? (Check all that apply.) **0 / 1 point**

- [x] The skip-connection makes it easy for the network to learn an identity mapping between the input and the output within the ResNet block.

  Correct
  This is true.

- [x] The skip-connections compute a complex non-linear function of the input to pass to a deeper layer in the network.

  This should not be selected
  This is false, skip connections make it easy for the model to learn an identity mapping, not a complex non-linear function.

- [ ] A ResNet with L layers would have on the order of L^2 skip connections in total.
- [ ] Using a skip-connection helps the gradient to backpropagate and thus helps you to train deeper networks

Expand

Incorrect
You didn't select all the correct answers

6. 1×1 convolutions are the same as multiplying by a single number. True/False? **0 / 1 point**

- ○ True
- ○ False

Expand

✗ **Incorrect**
You did not choose an option.

7. Which of the following are true about bottleneck layers? (Check all that apply) **0 / 1 point**

- ☐ The use of bottlenecks doesn't seem to hurt the performance of the network.
- ☐ The bottleneck layer has a more powerful regularization effect than Dropout layers.
- ☑ By adding these layers we can reduce the computational cost in the inception modules.

✓ **Correct**
Yes, by using the 1 × 1 convolutional layers we can reduce the depth of the volume and help reduce the computational cost of applying other convolutional layers with different filter sizes.

- ☑ Bottleneck layers help to compress the 1x1, 3x3, 5x5 convolutional layers in the inception network.

! **This should not be selected**
No, the bottleneck layer doesn't combine any of these different layers.

Expand

✗ **Incorrect**
You didn't select all the correct answers

8. When having a small training set to construct a classification model, which of the following is a strategy of transfer learning that you would use to build the model? **1 / 1 point**

- ○ It is always better to train a network from a random initialization to prevent bias in our model.
- ◉ Use an open-source network trained in a larger dataset freezing the layers and re-train the softmax layer.
- ○ Use an open-source network trained in a larger dataset. Use these weights as an initial point for the training of the whole network.
- ○ Use an open-source network trained in a larger dataset, freeze the softmax layer, and re-train the rest of the layers.

Expand

✓ **Correct**
Yes, this is a strategy that can provide a good result with small data.

9. Which of the following are true about Depthwise-separable convolutions? (Choose all that apply) **0 / 1 point**

- ☐ The pointwise convolution convolves the output volume with 1×1 filters.
- ☑ Depthwise-separable convolutions are composed of two different types of convolutions.

✓ **Correct**
Yes, it is composed of a depthwise convolution followed by a pointwise convolution.

- ☐ The depthwise convolution convolves the input volume with 1×1 filters over the depth dimension.
- ☑ The depthwise convolution convolves each channel in the input volume with a separate filter.

Correct

Yes, the output of this kind of convolution is the same as the input.

Expand

Incorrect

You didn't select all the correct answers

10. Suppose that in a MobileNet v2 Bottleneck block the input volume has shape $64 \times 64 \times 16$. If we use 32 filters for the expansion and 16 filters for the projection. What is the size of the input and output volume of the depthwise convolution, assuming a pad='same'? 1 / 1 point

- $64 \times 64 \times 32$ $64 \times 64 \times 32$
- $64 \times 64 \times 32$ $64 \times 64 \times 16$
- $64 \times 64 \times 16$ $64 \times 64 \times 32$
- $32 \times 32 \times 32$ $32 \times 32 \times 32$

Expand

Correct

Correct, the size of the input and output volume of the depthwise convolution is determined by the number of filters in the expansion.