Your grade: 100%

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To pass you need at least 80%. We keep your highest score.

Next item →

1. When building a ConvNet, typically you start with some POOL layers followed by some CONV layers. True/False? **1 / 1 point**

- (•) False
- ( ) True

Correct
Correct. It is typical for ConvNets to use a POOL layer after some Conv layers; sometimes even one POOL layer after each CONV layer; but is not common to start with POOL layers.

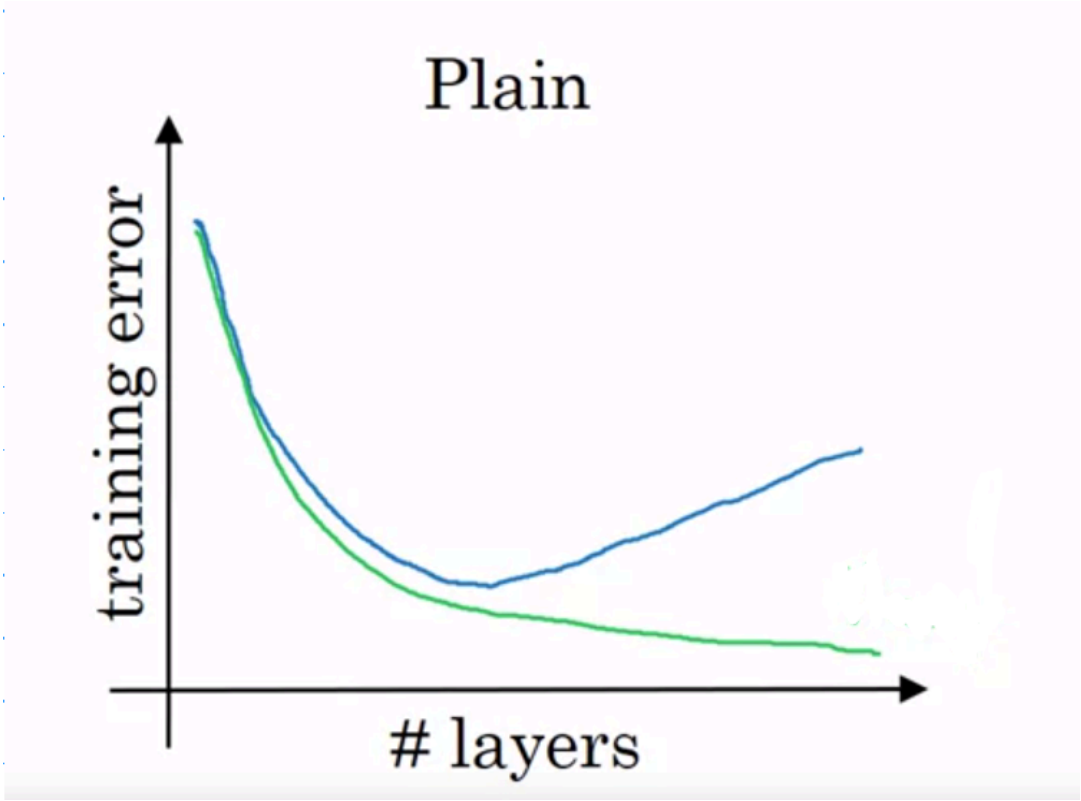
2. LeNet - 5 made extensive use of padding to create valid convolutions, to avoid increasing the number of channels after every convolutional layer. True/False? **1 / 1 point**

- ( ) True
- (•) False

Correct
Yes, back in 1998 when the corresponding paper of LeNet - 5 was written padding wasn't used.

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 **1 / 1 point**

we get in practice? This when using plain neural networks.



- ○ The blue one depicts the theory, and the green one the reality.
- ◉ The green one depicts the results in theory, and the blue one the reality.
- ○ The blue one depicts the results in theory, and also in practice.
- ○ The green one depicts the results in theory, and also in practice.

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. Which of the following equations captures the computations in a ResNet block?b **1 / 1 point**

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

Correct
Correct. This expresses the computations of a ResNet block, where the last term $a^{[l]}$ is the shortcut connection.

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

- [ ] The skip-connections compute a complex non-linear function of the input to pass to a deeper layer in the network.
- [ ] A ResNet with L layers would have on the order of L^2 skip connections in total.
- [x] Using a skip-connection helps the gradient to backpropagate and thus helps you to train deeper networks

Correct
This is true.

6. Suppose you have an input volume of dimension n_H x n_W x n_C. Which of the following statements do you agree with? (Assume that the "1x1 convolutional layer" below always uses a stride of 1 and no padding.) **1 / 1 point**

- [ ] You can use a 2D pooling layer to reduce n_H, n_W, and n_C.
- [x] You can use a 2D pooling layer to reduce n_H, n_W, but not n_C.

Correct
This is correct.

- [ ] You can use a 1x1 convolutional layer to reduce n_H, n_W, and n_C.
- [x] You can use a 1x1 convolutional layer to reduce n_C but not n_H and n_W.

Correct
Yes, a 1x1 convolutional layer with a small number of filters is going to reduce n_C but will keep the dimensions n_H and n_W

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

- [x] One problem with simply stacking up several layers is the computational cost of it.

Correct
Correct. That is why the bottleneck layer is used to reduce the computational cost.

- [x] Inception blocks allow the use of a combination of 1x1, 3x3, 5x5 convolutions and pooling by stacking up all the activations resulting from each type of layer.

Correct

Correct. The use of several different types of layers and stacking up the results to get a single volume is at the heart of the inception network.

- [ ] Inception blocks allow the use of a combination of 1x1, 3x3, 5x5 convolutions, and pooling by applying one layer after the other.

- [ ] Making an inception network deeper won't hurt the training set performance.

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, freeze the softmax layer, and re-train the rest of the layers.

- (•) 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.

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) **1 / 1 point**

- [ ] The depthwise convolution convolves the input volume with 1×1 filters over the depth dimension.

- [x] 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.

- [x] The pointwise convolution convolves the output volume with 1×1 filters.

Correct
Yes, the number of filters for the output of the depthwise-separable convolution is determined by the number of 1×1 filters used.

- [x] 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.

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'?

- ○ $32 \times 32 \times 32$, $32 \times 32 \times 32$
- ○ $64 \times 64 \times 32$, $64 \times 64 \times 16$
- ○ $64 \times 64 \times 16$, $64 \times 64 \times 32$
- ◉ $64 \times 64 \times 32$, $64 \times 64 \times 32$

Correct

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