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

- (•) False
- ( ) True

Expand

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

- (•) False
- ( ) True

Expand

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

3. The motivation of Residual Networks is that very deep networks are so good at fitting complex functions that when training them we almost always overfit the training data. True/False? 1 / 1 point

- (•) False
- ( ) True

Expand

Correct
Correct, very deep neural networks are hard to train and a deeper network does not always imply lower training error. Residual Networks allow us to train very deep neural networks.

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

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

Expand

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

5. In the best scenario when adding a ResNet block it will learn to approximate the identity function after a lot of training, helping improve the overall performance of the network. True/False? 1 / 1 point

- ( ) True
- (•) False

Expand

Correct
Correct. When adding a ResNet block it can easily learn to approximate the identity function, thus in a worst-case scenario, it will not affect the performance of the network at all.

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

- (•) False
- ( ) True

Expand

Correct
Yes, a 1×1 layer doesn't act as a single number because it makes a sum over the depth of the volume.

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

- [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.
- [ ] Making an inception network deeper won't hurt the training set performance.
- [ ] One problem with simply stacking up several layers is the computational cost of it.
- [x] Inception blocks allow the use of a combination of 1x1, 3x3, 5x5 convolutions, and pooling by applying one layer after the other.

  This should not be selected
  Incorrect. An inception block stacks up the result of applying the different size convolutions and the pooling in a single volume.

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

- (•) 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.
- ( ) 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.

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

- [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.
- [ ] The pointwise convolution convolves the input volume with 1×1 filters.
- [ ] The depthwise convolution convolves the input volume with 1×1 filters over the depth dimension.
- [x] Depthwise-separable convolutions are composed of two different types of convolutions.

  Correct

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Expand

Incorrect
You didn't select all the correct answers

10. Suppose that in a MobileNet v2 Bottleneck block we have an $n \times n \times 5$ input volume, we use 30 filters for the expansion, in the depthwise convolutions we use 3×3 filters, and 20 filters for the projection. How many parameters are used in the complete block, suppose we don't use bias? 1 / 1 point

- (•) 1020
- ( ) 8250
- ( ) 80
- ( ) 1101

Expand

Correct
Yes, the expansion filters use 5 × 30 = 150 parameters, the depthwise convolutions need 3 × 3 × 30 = 270 parameters, and the projection part 30 × 20 = 600 parameters.