Try again once you are ready

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Try again

1. Which of the following do you typically see in a ConvNet? (Check all that apply.) 1 / 1 point

- [x] FC layers in the last few layers

  Correct
  True, fully-connected layers are often used after flattening a volume to output a set of classes in classification.

- [x] Multiple CONV layers followed by a POOL layer

  Correct
  True, as seen in the case studies.

- [ ] FC layers in the first few layers
- [ ] Multiple POOL layers followed by a CONV layer

Expand

Correct
Great, you got all the right answers.

2. In LeNet - 5 we can see that as we get into deeper networks the number of channels increases while the height and width of the volume decreases. True/False? 1 / 1 point

- (•) True
- ( ) False

Expand

Correct
Correct, since in its implementation only valid convolutions were used, without padding, the height and width of the volume were reduced at each convolution. These were also reduced by the POOL layers, whereas the number of channels was increased from 6 to 16.

3. Training a deeper network (for example, adding additional layers to the network) allows the network to fit more complex functions and thus almost always results in lower training error. For this question, assume we're referring to "plain" networks. 1 / 1 point

- (•) False
- ( ) True

Expand

Correct
Correct, Resnets are here to help us train very deep neural networks.

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

1 / 1 point

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

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
- (selected) 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. For a volume of $125 \times 125 \times 64$ which of the following can be used to reduce this to a $125 \times 125 \times 32$ volume?

1 / 1 point

- (selected) Use a 1×1 convolutional layer with a stride of 1, and 32 filters.
- Use a POOL layer of size 2×2 with a stride of 2.
- Use a POOL layer of size 2×2 but with a stride of 1.
- Use a 1×1 convolutional layer with a stride of 2, and 32 filters.

Expand

Correct
Yes, since using 1×1 convolutions is a great way to reduce the depth dimension without affecting the other dimensions.

7. Which ones of the following statements on Inception Networks are true? (Check all that apply.)

0 / 1 point

- [ ] Inception networks incorporate a variety of network architectures (similar to dropout, which randomly chooses a network architecture on each step) and thus has a similar regularizing effect as dropout.
- [ ] Making an inception network deeper (by stacking more inception blocks together) can improve performance, but can also lead to overfitting and increase in computational cost.
- [x] A single inception block allows the network to use a combination of 1x1, 3x3, 5x5 convolutions and pooling.

Correct

- [x] Inception blocks usually use 1x1 convolutions to reduce the input data volume's size before applying 3x3 and 5x5 convolutions.

Correct

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? 0 / 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. Use these weights as an initial point for the training of the whole network.
- Use an open-source network trained in a larger dataset freezing the layers and re-train the softmax layer.

Expand

Incorrect
No, the intuition on using transfer learning with small datasets is that the first layers might have learned features that are useful for a new task; but the softmax layer might be significantly different.

9. Which of the following are true about Depthwise-separable convolutions? (Choose all that apply) 0 / 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] 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 pointwise convolution convolves the output volume with 1×1 filters.

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

- 80
- 8250
- 1020
- 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.