Your grade: 87.50%

Your latest: **87.50%** • Your highest: **87.50%** • To pass you need at least 80%. We keep your highest score.

Next item

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

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

  Correct
  True, as seen in the case studies.

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

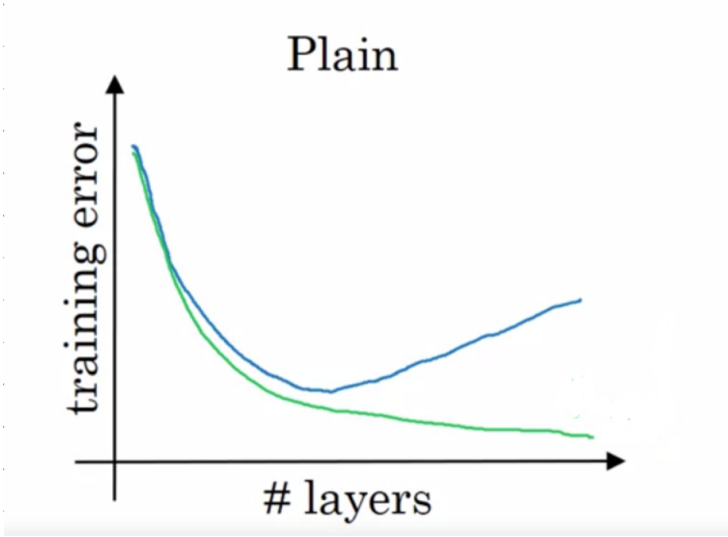
- [ ] FC layers in the first few layers

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 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 blue one depicts the results in theory, and also in practice.
- (•) The green one depicts the results in theory, and the blue one the reality.
- ( ) 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. The following equation captures the computation in a ResNet block. What goes into the two blanks above? 1 / 1 point

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

- (•) $a^{[l]}$ and 0, respectively

- ○ 0 and $a^{[l]}$, respectively
- ○ $z^{[l]}$ and $a^{[l]}$, respectively
- ○ 0 and $z^{[l+1]}$, respectively

Correct
Correct

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

- ☑ Using a skip-connection helps the gradient to backpropagate and thus helps you to train deeper networks

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.
- ☑ 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.

- ☐ A ResNet with L layers would have on the order of L^2 skip connections in total.

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**

- ○ Use a POOL layer of size 2×2 but with a stride of 1.
- ○ Use a POOL layer of size 2×2 with a stride of 2.
- ◉ Use a 1×1 convolutional layer with a stride of 1, and 32 filters.
- ○ Use a 1×1 convolutional layer with a stride of 2, and 32 filters.

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.) **0.75 / 1 point**

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

Correct

- ☐ 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.
- ☑ A single inception block allows the network to use a combination of 1x1, 3x3, 5x5 convolutions and pooling.

Correct

- ☐ 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.

You didn't select all the correct answers

8. Models trained for one computer vision task can't be used directly in another task. In most cases, we must change the softmax layer, or the last layers of the model and re-train for the new task. True/False? **1 / 1 point**

- ◉ True
- ○ False

Correct
Yes, this is a good way to take advantage of open-source models trained more or less for the task you want to do. This may also help you save a great number of computational resources and data.

9. In Depthwise Separable Convolution you: **0 / 1 point**

- ☐ Perform one step of convolution.
- ☐ You convolve the input image with a filter of n_f x n_f x n_c where n_c acts as the depth of the filter (n_c is the number of color channels of the input image).

- [ ] For the “Depthwise” computations each filter convolves with all of the color channels of the input image.
- [x] For the “Depthwise” computations each filter convolves with only one corresponding color channel of the input image.

Correct

- [x] Perform two steps of convolution.

Correct

- [x] The final output is of the dimension n_{out} x n_{out} x $n_c^{'}$ (where $n_c^{'}$ is the number of filters used in the pointwise convolution step).

Correct

- [ ] The final output is of the dimension n_{out} x n_{out} x n_c (where n_c is the number of color channels of the input image).
- [ ] You convolve the input image with n_c number of n_f x n_f filters (n_c is the number of color channels of the input image).

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**

- ○ 8250
- ○ 80
- ◉ 1020
- ○ 1101

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