Congratulations! You passed!

Grade received 80% | Latest Submission Grade 80% | To pass 80% or higher | Retake the assignment in **7h 25m** | **Go to next item**

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

- ○ True
- ◉ False

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.

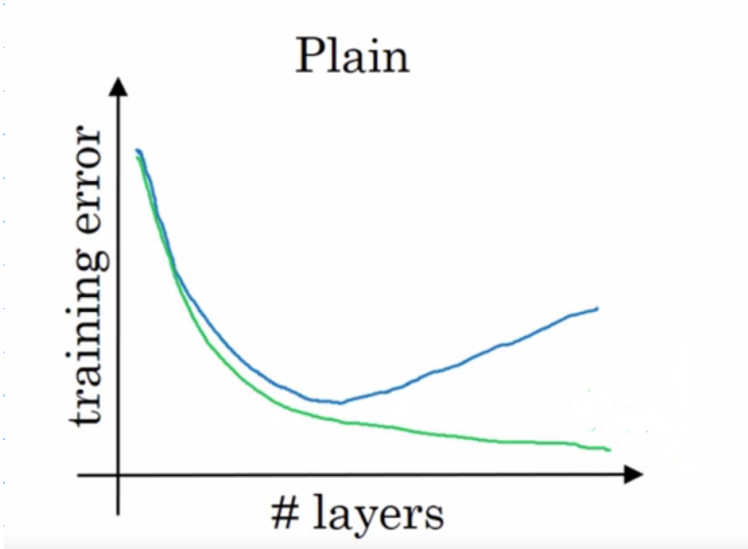
2. In order to be able to build very deep networks, we usually only use pooling layers to downsize the height/width of the activation volumes while convolutions are used with "valid" padding. Otherwise, we would downsize the input of the model too quickly. **1 / 1 point**

- ○ 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 the blue 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.

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

Expand

Correct
Correct

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

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

  Correct
  This is true.

- [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.

Expand

Correct
Great, you got all the right answers.

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

- True
- False

Expand

Correct

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 bottleneck layers? (Check all that apply) 0 / 1 point

- [ ] The use of bottlenecks doesn't seem to hurt the performance of the network.
- [x] 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.

- [x] The bottleneck layer has a more powerful regularization effect than Dropout layers.

  ! **This should not be selected**
  No, bottleneck layers are not intended as a regularization strategy.

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

Expand

Incorrect
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

- ( ) False
- (•) True

Expand

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

- [ ] For the "Depthwise" computations each filter convolves with all of the color channels of the input image.
- [ ] 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).
- [ ] Perform one step of convolution.
- [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.

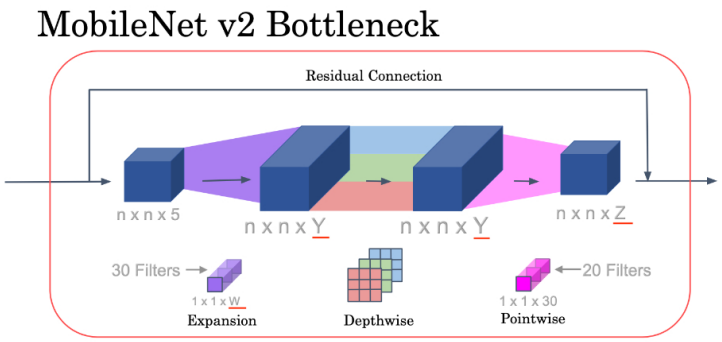
  ✓ **Correct**

- [ ] 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 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).

Expand

Incorrect
You didn't select all the correct answers

10. Fill in the missing dimensions shown in the image below (marked W, Y, Z). 1 / 1 point



- W = 30, Y = 20, Z =20
- W = 5, Y = 30, Z = 20
- W = 5, Y = 20, Z = 5
- W = 30, Y = 30, Z = 5

Expand

Correct