## **Deep Convolutional Models**

## Congratulations! You passed! Go to next item Grade **Latest Submission** To pass 80% or received 100% Grade 100% higher 1. Which of the following do you typically see in ConvNet? (Check all that apply.) 1/1 point Use of FC layers after flattening the volume to output classes. OnvNet makes exclusive use of CONV layers. Use of multiple POOL layers followed by a CONV layer. Multiple FC layers followed by a CONV layer. ∠<sup>7</sup> Expand ✓ Correct Yes, FC layers are typically used in the last few layers after flattening the volume to generate the output in classification. 2. LeNet - 5 made extensive use of padding to create valid convolutions, to avoid increasing the number of channels 1/1 point after every convolutional layer. True/False? True False

**⊘** Correct

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

**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

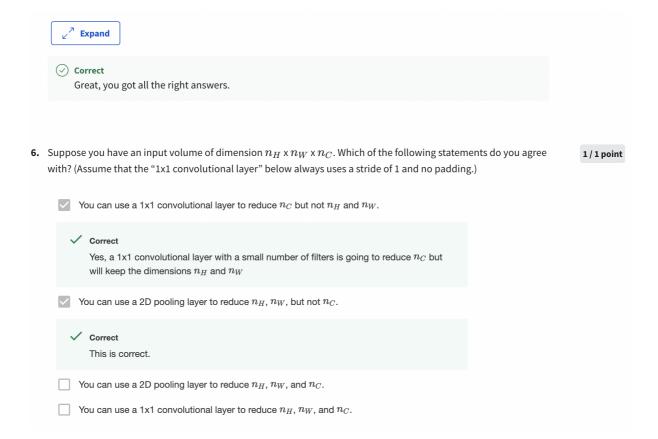
Correct, Resnets are here to help us train very deep neural networks.

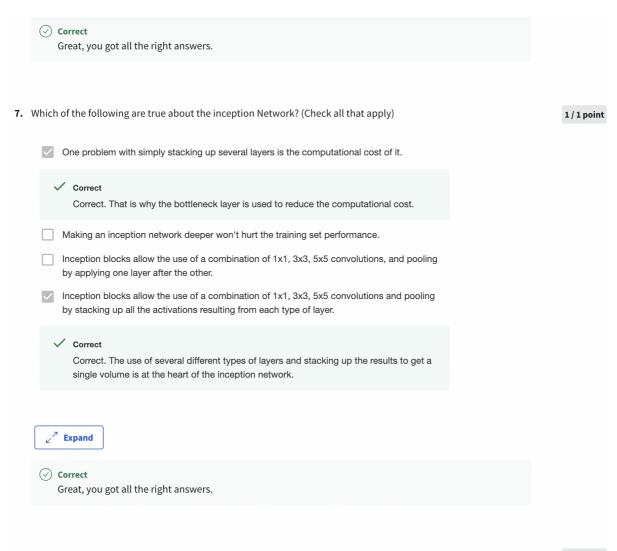
**4.** The computation of a ResNet block is expressed in the equation:

1/1 point

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

	Which part corresponds to the skip connection?	
	The equation of ResNet.	
	The term in the orange box, marked as B.	
	igcap The term in the blue box, marked as $A$ .	
	igcup The term in the red box, marked as $C$ .	
	∠ <sup>7</sup> Expand	
	<ul> <li>Correct</li> <li>Yes, this term is the result of the skip connection or shortcut.</li> </ul>	
5.	Which ones of the following statements on Residual Networks are true? (Check all that apply.)  The skip-connection makes it easy for the network to learn an identity mapping between the	1/1po
	input and the output within the ResNet block.	
	✓ Correct This is true.	
	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.	
	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	



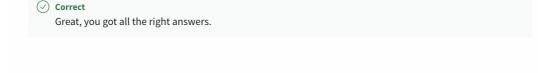


**8.** Parameters trained for one computer vision task can't be used directly in another task. In most cases, we must change the softmax layer, or the last layers of the model and re-train for the new task. True/False?

1/1 point

True
○ False
Expand
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.
Which of the following are true about Depthwise-separable convolutions? (Choose all that apply)
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.
· · · · · · · · · · · · · · · · · · ·
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 deathwise convolution convolute the input values with 1 v. 1 filters over the death
The depthwise convolution convolves the input volume with $1  imes 1$ filters over the depth
dimension.

✓ Correct
Yes, the number of filters for the output of the depthwise-separable convolution is determined by the number of 1 x 1 filters used.
∠ Expand



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'?

1/1 point

- $\bigcirc 64 \times 64 \times 32 \ 64 \times 64 \times 16$
- $\bigcirc \phantom{0}64 \times 64 \times 16\phantom{0}64 \times 64 \times 32\phantom{0}$
- $\bigcirc \ \ 32\times 32\times 32 \ \ 32\times 32\times 32$
- $\bigcirc$  64 × 64 × 32 64 × 64 × 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.