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.

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

  Correct
  True, as seen in the case studies.

Expand

Correct
Great, you got all the right answers.

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. 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**

- ( ) True
- (•) False

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. The following equation captures the computation in a ResNet block. What goes into the two blanks above? **1 / 1 point**

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

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

- [ ] The skip-connections compute a complex non-linear function of the input to pass to a deeper layer in the network.
- [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.

- [ ] A ResNet with L layers would have on the order of L^2 skip connections in total.
- [x] Using a skip-connection helps the gradient to backpropagate and thus helps you to train deeper networks

  Correct
  This is true.

Expand

Correct
Great, you got all the right answers.

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? **0 / 1 point**

- Use a 1×1 convolutional layer with a stride of 2, and 32 filters.
- 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.
- [illegible] of size 2×2 but with a stride of 1.

Expand

Incorrect
No, the POOL layer doesn't affect the depth dimension of the volume.

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

- [ ] Inception blocks allow the use of a combination of 1x1, 3x3, 5x5 convolutions, and pooling by applying one layer after the other.
- [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.

- [x] One problem with simply stacking up several layers is the computational cost of it.

Correct
Correct. That is why the bottleneck layer is used to reduce the computational cost.

- [ ] Making an inception network deeper won't hurt the training set performance.

Expand

Correct
Great, you got all the right answers.

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**

- 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. Which of the following are true about Depth wise-separable convolutions? (Choose all that apply) **0 / 1 point**

- [x] The result has always the same number of channels n_c as the input.

This should not be selected
No, this is true only for the depthwise convolution.

- [x] They combine depthwise convolutions with pointwise convolutions.

Correct
Correct, this combination is what we call depth wise separable convolutions.

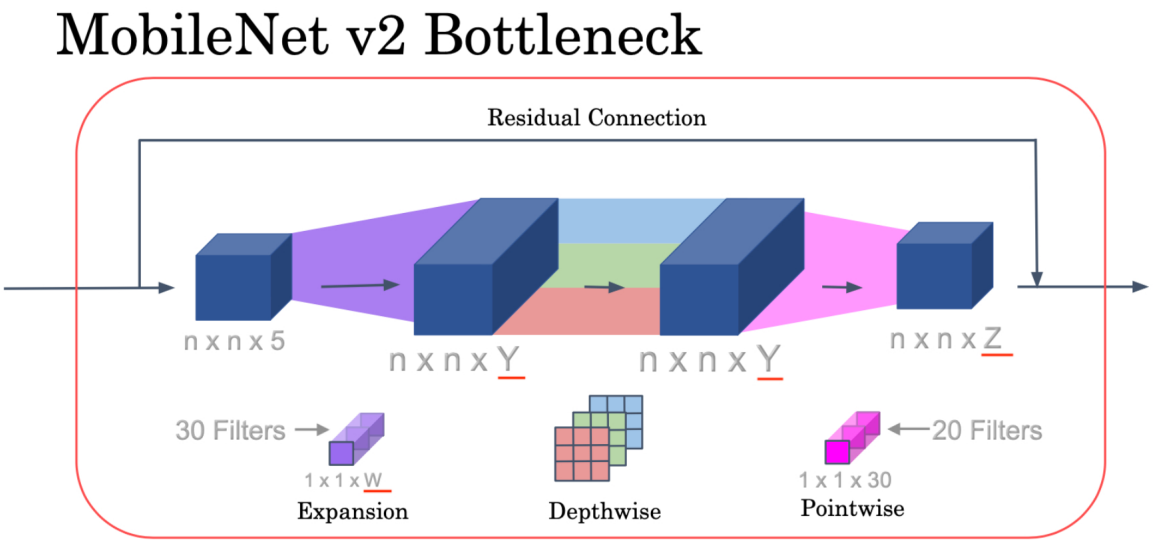
- [ ] They have a lower computational cost than normal convolutions.
- [x] They are just a combination of a normal convolution and a bottleneck layer.

This should not be selected
No, they combine separable convolution with pointwise convolutions, although the last one can be seen as a bottleneck layer.

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

Expand

Correct