Congratulations! You passed!

Grade received 100% **Latest Submission Grade** 100% **To pass** 80% or higher

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

- ○ Multiple FC layers followed by a CONV layer.
- ○ Use of multiple POOL layers followed by a CONV layer.
- ◉ Use of FC layers after flattening the volume to output classes.
- ○ ConvNet makes exclusive use of CONV layers.

Expand

Correct
Yes, FC layers are typically used in the last few layers after flattening the volume to generate the output in classification.

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. 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**

- ○ True
- ◉ False

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**

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

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
- 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**

- Use a POOL layer of size 2×2 but with a stride of 1.
- 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.
- Use a POOL layer of size 2×2 with a stride of 2.

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.) **1 / 1 point**

- [ ] Making an inception network deeper (by stacking more inception blocks together) might not hurt training set performance.
- [ ] 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.
- [x] Inception blocks usually use 1x1 convolutions to reduce the input data volume's size before applying 3x3 and 5x5 convolutions.

Correct

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

✓ Correct

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**

- (•) True
- ( ) False

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) **1 / 1 point**

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

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

- [x] They have a lower computational cost than normal convolutions.

  ✓ Correct
  Yes, as seen in the lectures the use of the depthwise and pointwise convolution reduces the computational cost significantly.

- [ ] They are just a combination of a normal convolution and a bottleneck layer.
- [ ] The result has always the same number of channels n_c as the input.

Expand

✓ Correct
Great, you got all the right answers.

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**

- ( ) $64 \times 64 \times 32$ $64 \times 64 \times 16$
- (•) $64 \times 64 \times 32$ $64 \times 64 \times 32$
- ( ) $32 \times 32 \times 32$ $32 \times 32 \times 32$
- ( ) $64 \times 64 \times 16$ $64 \times 64 \times 32$

Expand

Correct

Correct, the size of the input and output volume of the depthwise convolution is determined by the number of filters in the expansion.