Your grade: 100%

Your latest: **100%** • Your highest: **100%** • 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**

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

  ✓ **Correct**
  True, as seen in the case studies.

- [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.

Expand

Correct
Great, you got all the right answers.

2. In LeNet - 5 we can see that as we get into deeper networks the number of channels increases while the height and width of the volume decreases. True/False? — **1 / 1 point**

- ( ) False
- (•) True

Expand

Correct
Correct, since in its implementation only valid convolutions were used, without padding, the height and width of the volume were reduced at each convolution. These were also reduced by the POOL layers, whereas the number of channels was increased from 6 to 16.

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**

- (•) False
- ( ) True

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 computation of a ResNet block is expressed in the equation: — **1 / 1 point**

$$a^{[l+2]} = g\left(\underset{C}{\boxed{W^{[l+2]}}}\, g\left(W^{[l+1]}\, a^{[l]} + \underset{A}{\boxed{b^{[l+1]}}}\right) + b^{[l+2]} + \underset{B}{\boxed{a^{[l]}}}\right)$$

Which part corresponds to the skip connection?

- ( ) The equation of ResNet.
- (•) The term in the orange box, marked as B.
- ( ) The term in the blue box, marked as A.
- ( ) The term in the red box, marked as C.

Expand

Correct
Yes, this term is the result of the skip connection or shortcut.

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

- [ ] A ResNet with L layers would have on the order of L^2 skip connections in total.
- [ ] The skip-connections compute a complex non-linear function of the input to pass to a deeper layer in the network.
- [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.

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

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

  ✓ **Correct**

- [x] 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.

  ✓ **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.
- [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. Which of the following are common reasons for using open-source implementations of ConvNets (both the model and/or weights)? Check all that apply. — **1 / 1 point**

- [x] Parameters trained for one computer vision task are often useful as pre-training for other computer vision tasks.

  ✓ **Correct**
  True

- [ ] The same techniques for winning computer vision competitions, such as using multiple crops at test time, are widely used in practical deployments (or production system deployments) of ConvNets.
- [ ] A model trained for one computer vision task can usually be used to perform data augmentation for a different computer vision task.
- [x] It is a convenient way to get working with an implementation of a complex ConvNet architecture.

  ✓ **Correct**
  True

Expand

Correct
Great, you got all the right answers.

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

- [ ] 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).
- [x] 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).

  ✓ **Correct**

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

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**

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

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.