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
- [x] Multiple CONV layers followed by a POOL layer

Correct
True, as seen in the case studies.

- [ ] Multiple POOL layers followed by a CONV layer
- [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.

2. LeNet - 5 made extensive use of padding to create valid convolutions, to avoid increasing the number of channels after every convolutional layer. True/False? 1 / 1 point

- (•) False
- ( ) True

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

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

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

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

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

Correct
Correct

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

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

Correct
This is true.

- [ ] A ResNet with L layers would have on the order of L^2 skip connections in total.

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

- ( ) True
- (•) False

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 the inception Network? (Check all that apply) **1 / 1 point**

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

8. When having a small training set to construct a classification model, which of the following is a strategy of transfer learning that you would use to build the model? **1 / 1 point**

- ( ) Use an open-source network trained in a larger dataset, freeze the softmax layer, and re-train the rest of the layers.
- ( ) Use an open-source network trained in a larger dataset. Use these weights as an initial point for the training of the whole network.
- ( ) It is always better to train a network from a random initialization to prevent bias in our model.
- (•) Use an open-source network trained in a larger dataset freezing the layers and re-train the softmax layer.

Correct
Yes, this is a strategy that can provide a good result with small data.

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

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

- [ ] 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

10. Suppose that in a MobileNet v2 Bottleneck block we have an $n \times n \times 5$ input volume, we use 30 filters for the expansion, in the depthwise convolutions we use 3×3 filters, and 20 filters for the projection. How many parameters are used in the complete block, suppose we don't use bias?

1 / 1 point

- (●) 1020
- ( ) 8250
- ( ) 1101
- ( ) 80

Correct

Yes, the expansion filters use $5 \times 30 = 150$ parameters, the depthwise convolutions need $3 \times 3 \times 30 = 270$ parameters, and the projection part $30 \times 20 = 600$ parameters.