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 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.

- [ ] 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

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**

- (•) True
- ( ) False

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

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

C A B

Which part corresponds to the skip connection?

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

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.
- [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.
- [x] 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.

Expand

Correct
Great, you got all the right answers.

6. Suppose you have an input volume of dimension n_H x n_W x n_C. Which of the following statements do you agree with? (Assume that the "1x1 convolutional layer" below always uses a stride of 1 and no padding.) **1 / 1 point**

- [x] You can use a 2D pooling layer to reduce n_H, n_W, but not n_C.

  Correct
  This is correct.

- [x] You can use a 1x1 convolutional layer to reduce n_C but not n_H and n_W.

  Correct
  Yes, a 1x1 convolutional layer with a small number of filters is going to reduce n_C but will keep the dimensions n_H and n_W

- [ ] You can use a 2D pooling layer to reduce n_H, n_W, and n_C.
- [ ] You can use a 1x1 convolutional layer to reduce n_H, n_W, and n_C.

Expand

Correct
Great, you got all the right answers.

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.
- [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.

- [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.

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

Expand

Correct
Great, you got all the right answers.

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**

- ( ) 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. Use these weights as an initial point for the training of the whole network.
- (•) Use an open-source network trained in a larger dataset freezing the layers and re-train the softmax layer.
- ( ) Use an open-source network trained in a larger dataset, freeze the softmax layer, and re-train the rest of the layers.

Expand

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

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

- [ ] They are just a combination of a normal convolution and a bottleneck layer.
- [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.

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

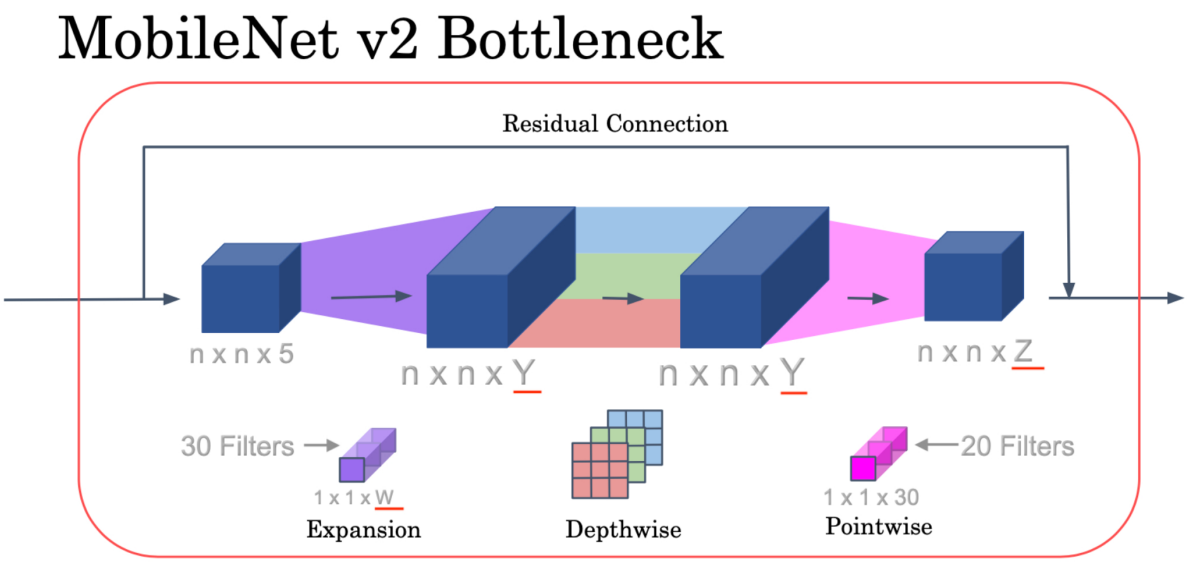
  ✓ **Correct**
  Correct, this combination is what we call depth wise separable convolutions.

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

Expand

✓ **Correct**
Great, you got all the right answers.

10. Fill in the missing dimensions shown in the image below (marked W, Y, Z). **1 / 1 point**



- ( ) W = 5, Y = 20, Z = 5
- ( ) W = 30, Y = 20, Z =20
- ( ) W = 30, Y = 30, Z = 5
- (•) W = 5, Y = 30, Z = 20

Expand

Correct