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

- [ ] 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.

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

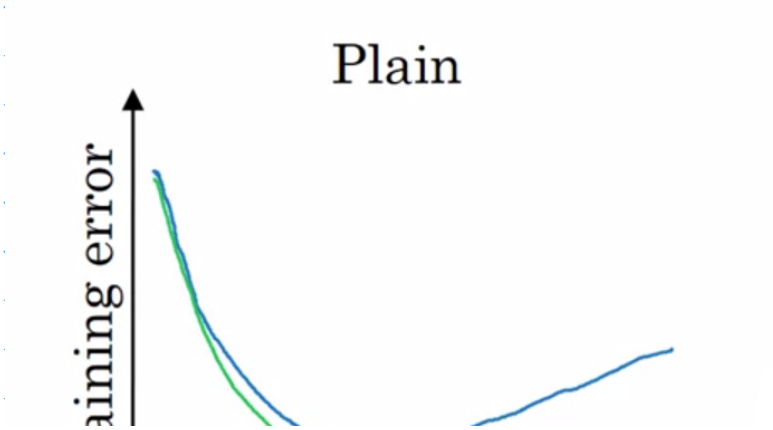
2. In LeNet - 5 we can see that as we get into deeper networks the number of channels increases while the height and width of the volume decreases. True/False? 1 / 1 point

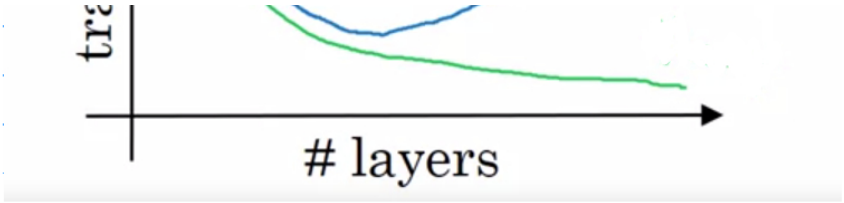
- (•) True
- ( ) False

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. Based on the lectures, in the following picture, which curve corresponds to the expected behavior in theory, and which one corresponds to the behavior we get in practice? This when using plain neural networks. 1 / 1 point





- The green one depicts the results in theory, and also in practice.
- The blue one depicts the theory, and the green one the reality.
- The blue one depicts the results in theory, and also in practice.
- The green one depicts the results in theory, and the blue one the reality.

Expand

Correct
Yes, in theory, we expect that as we increase the number of layers the training error decreases; but in practice after a certain number of layers the error increases.

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

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

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

Expand

Correct
Correct

5. Adding a ResNet block to the end of a network makes it deeper. Which of the following is true? **1 / 1 point**

- The performance of the networks is hurt since we make the network harder to train.
- The number of parameters will decrease due to the shortcut connections.
- The performance of the networks doesn't get hurt since the ResNet block can easily approximate the identity function.
- It shifts the behavior of the network to be more like the identity function.

Expand

Correct
Yes, as noted in the lectures in a ResNet block the computations are given by $a^{[l+2]} = g(W^{[l+2]}a^{[l+1]} + b^{[l+2]} + a^{[l]})$ thus if $W^{[l+2]}$ and $b^{[l+2]}$ are zero then we get the identity function.

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

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Correct
Yes, since using 1×1 convolutions is a great way to reduce the depth dimension without affecting the other dimensions.

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

- [x] By adding these layers we can reduce the computational cost in the inception modules.

Correct
Yes, by using the 1 × 1 convolutional layers we can reduce the depth of the volume and help reduce the computational cost of applying other convolutional layers with different filter sizes.

- [x] The use of bottlenecks doesn't seem to hurt the performance of the network.

Correct
Yes, although it reduces the computational cost significantly.

- [ ] Bottleneck layers help to compress the 1x1, 3x3, 5x5 convolutional layers in the inception network.
- [ ] The bottleneck layer has a more powerful regularization effect than Dropout layers.

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

- [ ] A model trained for one computer vision task can usually be used to perform data augmentation for a different computer vision task.
- [ ] 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.
- [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**

- [x] Perform two steps of convolution.

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] For the "Depthwise" computations each filter convolves with only one corresponding color channel of the input image.

✓ Correct

- [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).

n_{out}

n_{out} x

n_{out}

n_{out} x

$n_c^{'}$

(where

$n_c^{'}$

is the number of filters used in the pointwise convolution step).

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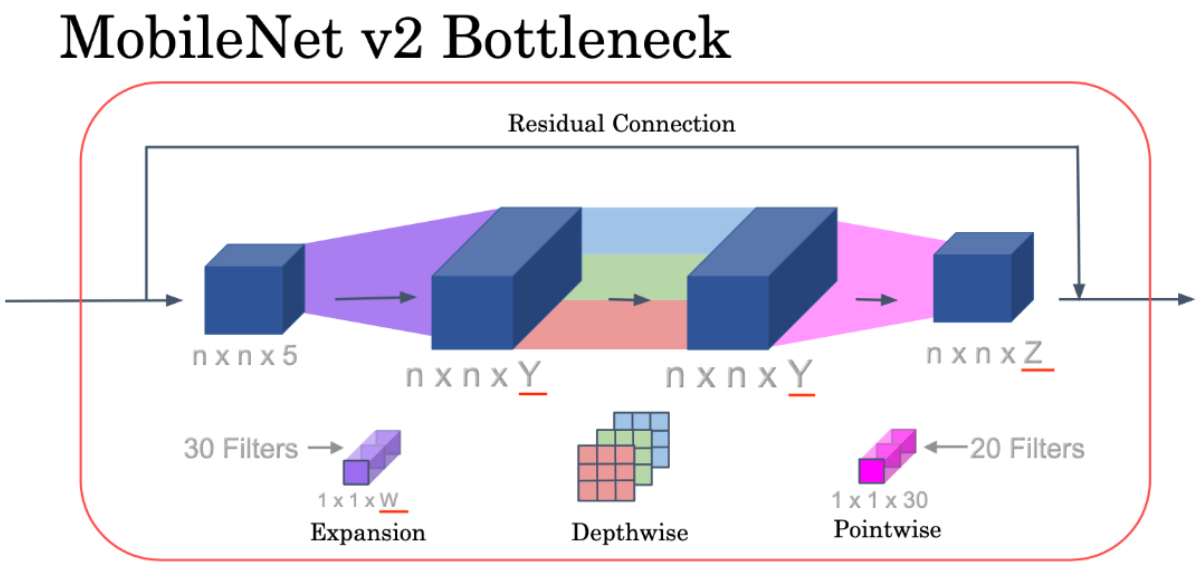
✓ Correct
Great, you got all the right answers.

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



- [ ] W = 30, Y = 20, Z =20
- [ ] W = 30, Y = 30, Z = 5
- [x] W = 5, Y = 30, Z = 20
- [ ] W = 5, Y = 20, Z = 5

Expand

✓ Correct