edX **Microsoft:** DAT236x Deep Learning Explained   <u>Help</u>

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Knowledge Checks

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DAT236x-M4-05

1/1 point (graded)
What is the name of the first deep convolutional network used to read zip codes and handwritten digits?

- ○ VGG

- ○ AlexNet

- ◉ LeNet ✔

- ○ ResNet

- ○ GoogleNet

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DAT236x-M4-10

1/1 point (graded)
In a typical deep CNN such as AlexNex, where does the largest number of parameters come from?

- ○ Convolutions with large filter sizes

○ Dense layers at the end of a deep CNN network ✔

○ Max pooling layers

○ None of the above

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DAT236x-M4-01

1/1 point (graded)
What are three key motivations behind Convolution networks relative to Multi-layer perceptron?

☑ Preserve the spatial structure of the input data

☑ Reduce the number of model parameters

☐ Reduce number of computations

☑ Detect features irrespective of the location in the image

✔

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DAT236x-M4-08

1/1 point (graded)
Is it possible to have two or more pooling layers directly connected to one another with no convolutional layer in between?

○ Yes ✔

○　No

○　Only under certain special conditions

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DAT236x-M4-02

1/1 point (graded)
Which are three most commonly used activation functions in a convolutional network?

☑　ReLU

☑　MaxOut

☑　LeakyReLU

☐　abs

✔

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DAT236x-M4-12

1/1 point (graded)
Consider a CNN with the following information:

```
- Input layer
        - Channel: 1
        - Width: 28
        - Height: 28
- Convolutional layer
        - filter size: 5 x 5
        - number of filters: 8
        - stride: 2, 2
        - padding: true
```

What would be the number of parameters in the convolutional layer?

208 ✔

208

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DAT236x-M4-03

1/1 point (graded)

Consider a CNN with an image input, three convolutional layers, and an output layer. Which five of the following options can affect the number of **nodes** created for the **first** convolutional layer?

- ☑ the width and height of the input image

- ☐ the number of channels in the input image

- ☑ the size of the filter specified for the first convolutional layer

- ☑ the stride specified for the first convolutional layer

- ☑ the padding specified for the first convolutional layer

- ☑ the number of filters defined for the first convolutional layer

✔

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✔ Correct (1/1 point)

DAT236x-M4-07

1/1 point (graded)
What is the key motivation to introduce pooling in CNNs?

- ○ Reduce the spatial size of the output (representation)
- ● Reduce the number of parameters ✔
- ○ Introduce noise into the network
- ○ None of the above

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DAT236x-M4-11

1/1 point (graded)
Given the following image values and the filter weights, what is the value of the convolution operation?

Input Volume (+pad 1) (9x9x3)
x[:,:,0]

x[:,:,1]

x[:,:,2]

Filter W0 (3x3x3)
w0[:,:,0]   w0[:,:,1]   w0[:,:,2]

Bias b0 (1x1x1)
b0[:,:,0]

Output Volume (4x4x1)
o[:,:,0]

-2	3	3	-1
-2	-2	3	9
2	-4	2	5
3	1	1	

2 ✔

2

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DAT236x-M3-04

1/1 point (graded)

Consider a CNN with an image input, three convolutional layers, and an output layer. Which three of the following options can affect the number of **parameters** (weights and biases) created for the **first** convolutional layer (check all that apply):
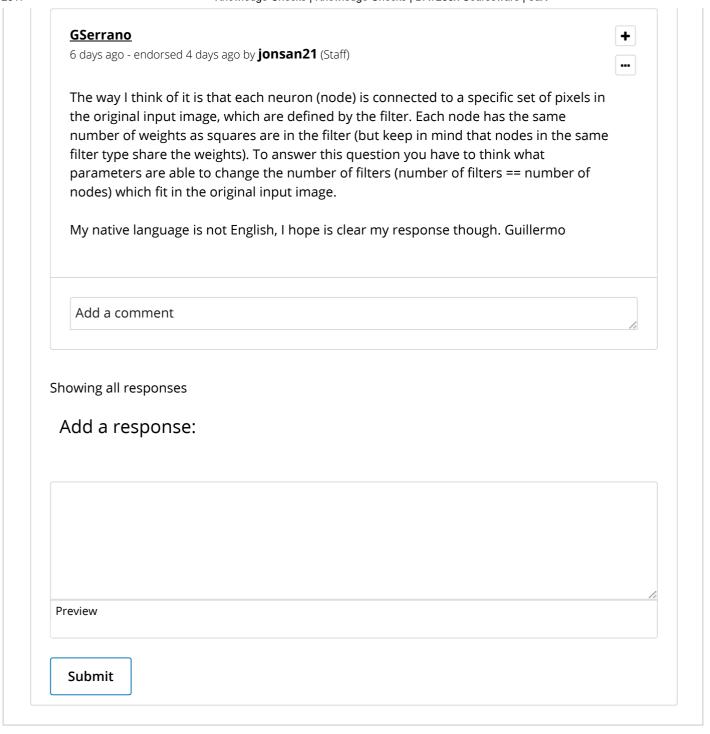
☐ the width and height of the input image

☑ the number of channels in the input image

☑ the size of the filter specified for the first convolutional layer

☐ the stride specified for the first convolutional layer

☐ the padding specified for the first convolutional layer

☑ the number of filters defined for the first convolutional layer

✔

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DAT236x-M4-06

1/1 point (graded)
How many layers deep does a ResNet or Residual Network that won the ImageNet
challenge in 2015 originally have, in order to classify objects in a natural scene images?

○ 18

○ 34

○ 64

⦿ 152 ✔

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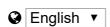## DAT236x-M4-09

1/1 point (graded)
Think about the different ways one can control the shape of the output of a convolutional
layer, which would become the input to the next layer, in the context of the material
presented in the course. **How can you change the shape of the output of a network that
is built using a combination of convolutional and pooling layers?**

☑ By changing strides greater than or equal to 1, keeping fixed filter shape, pad = True

☑ By varying Padding to be True / False, while keeping fixed filter shape and stride

☑ By using pooling with strides greater than or equal to 1

☐ By varying the settings to the minibatch size

✔

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DAT236x-M4-03

discussion posted 8 days ago by **pksorensen**

Would it be possible to get the answer for DAT236x-M4-03 ? I first assumed it to be strait forward, but as I could not get the answer correct - i might miss something in my understanding of nodes.

I think the reason for getting it wrong is due to not a clear definition of nodes and weights. And since I could only find 4 of the 5 that affected what I consided nodes, i assumed nodes=weights.

Consider a CNN with an image input, three convolutional layers, and an output layer. Which five of the following options can affect the number of nodes created for the first convolutional layer?

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GSerrano

+

...

6 days ago - endorsed 4 days ago by **jonsan21** (Staff)

The way I think of it is that each neuron (node) is connected to a specific set of pixels in the original input image, which are defined by the filter. Each node has the same number of weights as squares are in the filter (but keep in mind that nodes in the same filter type share the weights). To answer this question you have to think what parameters are able to change the number of filters (number of filters == number of nodes) which fit in the original input image.

My native language is not English, I hope is clear my response though. Guillermo

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