1/1 point

140

Grade received 80% To pass 80% or higher

Latest Submission Grade 80%

The Basics of ConvNets

1.	What do you think applying this filter to a grayscale image will do?	1

 $\begin{bmatrix} 0 & 1 & 1 & 0 \\ 1 & 3 & 3 & 1 \\ -1 & -3 & -3 & -1 \\ 0 & -1 & -1 & 0 \end{bmatrix}$

- Detect 45-degree edges.
- Detect horizontal edges.
- Detecting image contrast.
- Detect vertical edges.

Z Expand

(Correct

Correct. There is a high difference between the values in the top part from those in the bottom part of the matrix. When convolving this filter on a grayscale image, the horizontal edges will be detected.

2. Suppose your input is a 300 by 300 color (RGB) image, and you are not using a convolutional network. If the first hidden layer has 100 neurons, each one fully connected to the input, how many parameters does this hidden layer have (including the bias parameters)?

9,000,001

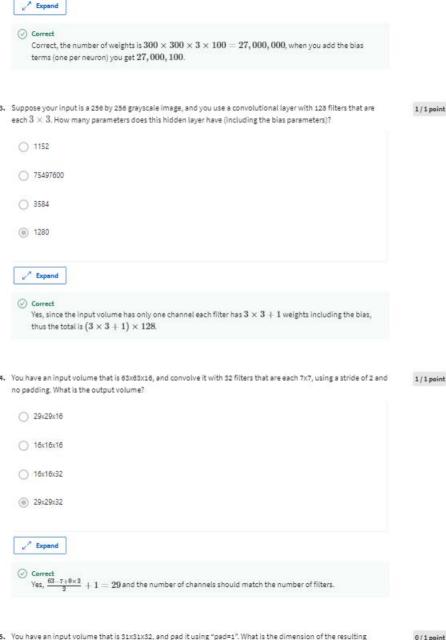
27,000,100

27,000,001

9,000,100

Z Expand

1/1 point



5.	You have an input volume that is $31x31x32$, and pad it using "pad=1". What is the dimension of the resulting volume (after padding)?	0 / 1 point
	32x32x32	
	○ 33x33x33	
	○ 33x33x32	
	○ 31x31x34	
	∠ Z Expand	
	No, the padding is applied to both sides of the height and width of the volume.	
6.	You have a volume that is $64 \times 64 \times 32$, and convolve it with 40 filters of 9×9 , and stride 1. You want to use a "same" convolution. What is the padding?	1/1 point
	0 0	
	○ 6	
	⊚ 4	
	○ 8	
	∠ [™] Expand	
	$igodots$ Correct Yes, when using a padding of 4 the output volume has $n_H=rac{121-9+2 imes4}{1}+1$.	
7.	You have an input volume that is $32\times32\times18$, and apply max pooling with a stride of 2 and a filter size of 2. What is the output volume?	1/1 point
	○ 16x16x8	
	○ 15x15x16	
	(iii) 16x16x16	
	32:32:8	

~	Correct	
	Correct, using the following formula: $n_H^{[l]} = rac{n_H^{[l-1]} + 2 imes p - f}{s} + 1$	
Becau	se pooling layers do not have parameters, they do not affect the backpropagation (derivati	ves) calculation.
0	True	
•	False	
7	Expand	
K	схрана	
1	Correct Everything that influences the loss should appear in the backpropagation because we are o	computing
	derivatives. In fact, pooling layers modify the input by choosing one value out of several va	16 1577
	input volume. Also, to compute derivatives for the layers that have parameters (Convolutio Connected), we still need to backpropagate the gradient through the Pooling layers.	ns, Fully-
Which	of the following are the benefits of using convolutional layers? (Check all that apply)	
V		
	It allows parameters learned for one task to be shared even for a different task (transfer learning).	_
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	(transfer learning).	
	(transfer learning). This should not be selected No, transfer learning is not bound to Conv/Nets and can be used with other types of	Î
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1/1 point

0/1 point

9.	Which	of the following are the benefits of using convolutional layers? (Check all that apply)	0/1 point
		It allows parameters learned for one task to be shared even for a different task (transfer learning).	
		This should not be selected No, transfer learning is not bound to Conv/Nets and can be used with other types of models as you've seen in Course 1-3.	
		It reduces the computations in backpropagation since we omit the convolutional layers in the process.	
		It reduces the total number of parameters, thus reducing overfitting through parameter sharing.	
		Convolutional layers are good at capturing translation invariance.	
		Correct Yes, this is due in part to applying the same filter all over the image.	
	2	Expand	
	~	Incorrect You didn't select all the correct answers	
10	. In lect	ture we talked about "sparsity of connections" as a benefit of using convolutional layers. What does this ?	1/1 point
	0	Each activation in the next layer depends on only a small number of activations from the previous layer.	
	0	Each filter is connected to every channel in the previous layer:	
	0	Each layer in a convolutional network is connected only to two other layers	
	0	Regularization causes gradient descent to set many of the parameters to zero.	
	2	Expand	
	~	Correct Yes, each activation of the output volume is computed by multiplying the parameters from only one filter with a volume slice of the input volume and then summing all these together.	