

Consider a convolution $s = u * w$ with the following inputs: $u=[3, 2, 0, 1]$, $w=[-1, 2, 1]$ and the output $s=[4, 7, 1, 2]$. What is the size of the gradient $\frac{\partial s}{\partial w}$?

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Consider a 1D max pooling with filter size 3, stride 2. Given the following input sequence, what is the output after pooling?

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| 0.5 | 1 | 0.7 | 0.1 | 0.2 |
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Define a 1D mean pooling operation that takes the average value (instead of max value) within a local window. With filter size 3, stride 2, and the following input sequence, what is the output after pooling?

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| 0.5 | 1 | 0.6 | 0.1 | 0.2 |
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- Sigmoid function
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Softmax function normalizes the output to a multinomial distribution.

Consider a convolutional network with a single convolutional layer and one fully connected layer for a 5-way classification problem. The feature map after convolution is of size $3 \times 3 \times 10$. What is the size of the weight in the fully connected layer?

- 90×5
- 9×5
- 30×5
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