

MCB128

Quiz b2

February 27, 2026

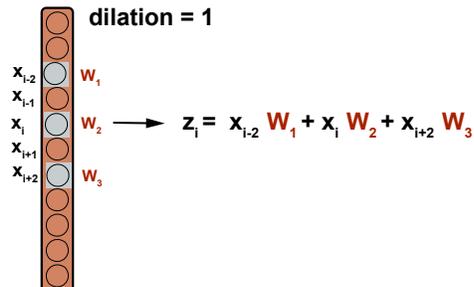
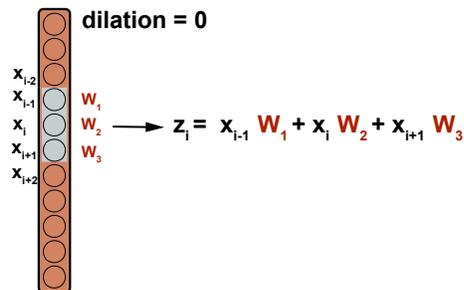
Name: _____

Score: _____

Instructions:

- Show all work for full credit.
- Can check notes; no prompts to chatbot allowed

1. (2 pts) Write the equation of a 1D convolution with a kernel of size 3 $W = (w_1, w_2, w_3)$, and a dilation of 0 and 1 respectively.



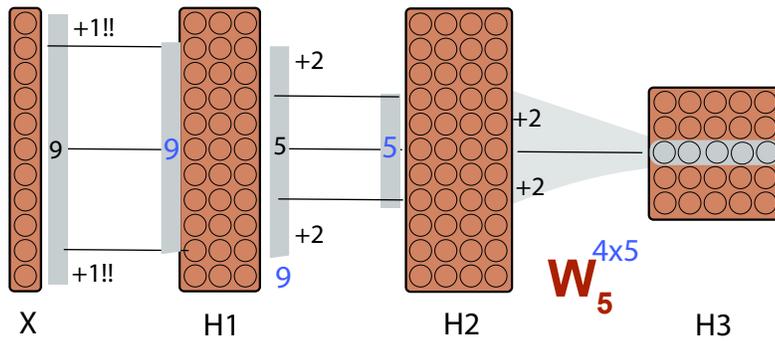
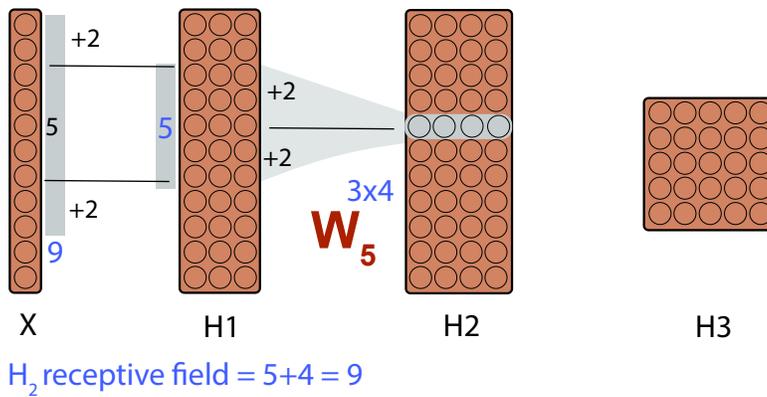
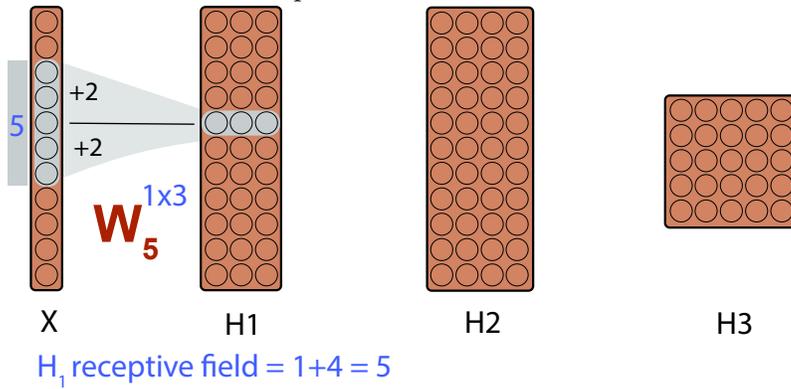
2. (2 pts) For a CNN output layer with dimension $[L, C_O]$, what would be the size of the layer after pooling with size of $L/2$? Which PyTorch function would you use (including arguments)?

The size after pooling is $[2, C_O]$.

`nn.MaxPool1d(kernel_size = L/2)`

3. (6 pts) A network consists of three 1D convolutional layers. At each layer, a zero-padded convolution with kernel size 5, stride 1, and dilation 0 is applied.

(a) What size is the receptive field of hidden units in the first, second and third layers?



H_3 receptive field = $9 + 2 = 11$

(both correct answers)

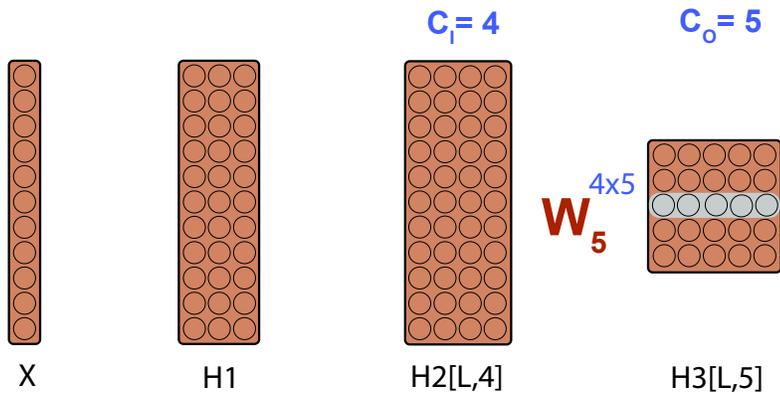
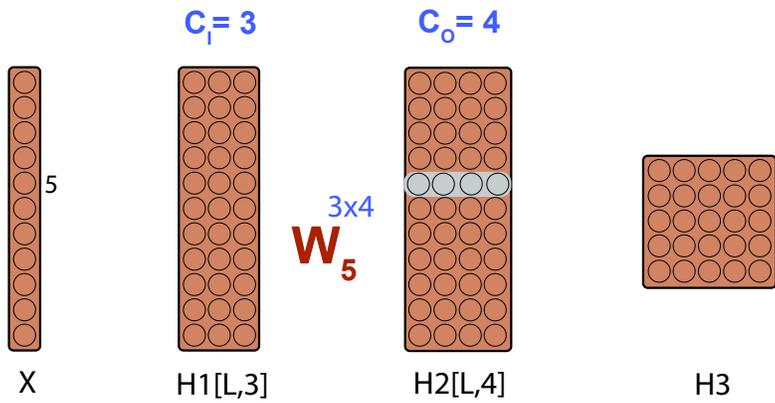
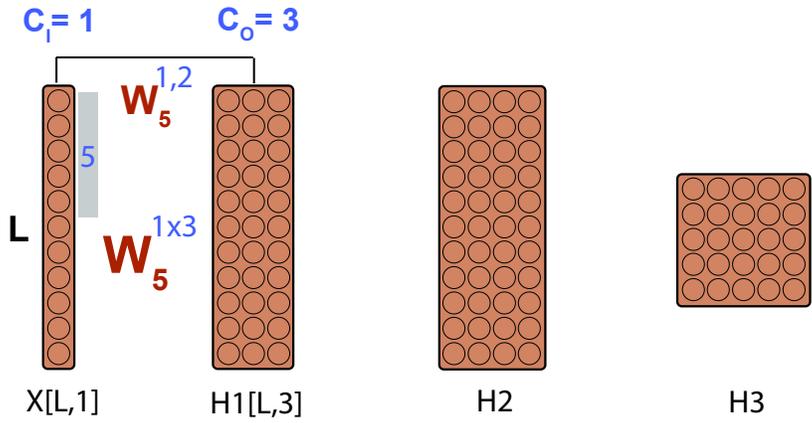
H_3 receptive field = $9 + 4 = 13$ (with padding)

adapted from: UDL, Prince

(b) How many W_5 kernels for the $X \rightarrow H_1$, $H_1 \rightarrow H_2$, and $H_2 \rightarrow H_3$ convolutions respectively?

CNN Kernels

$C_1 = \# \text{ input layer channels}$ $W[5, C_1, C_0]$
 $C_0 = \# \text{ output layer channels}$ $W_5^{C_1 \times C_0}$



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