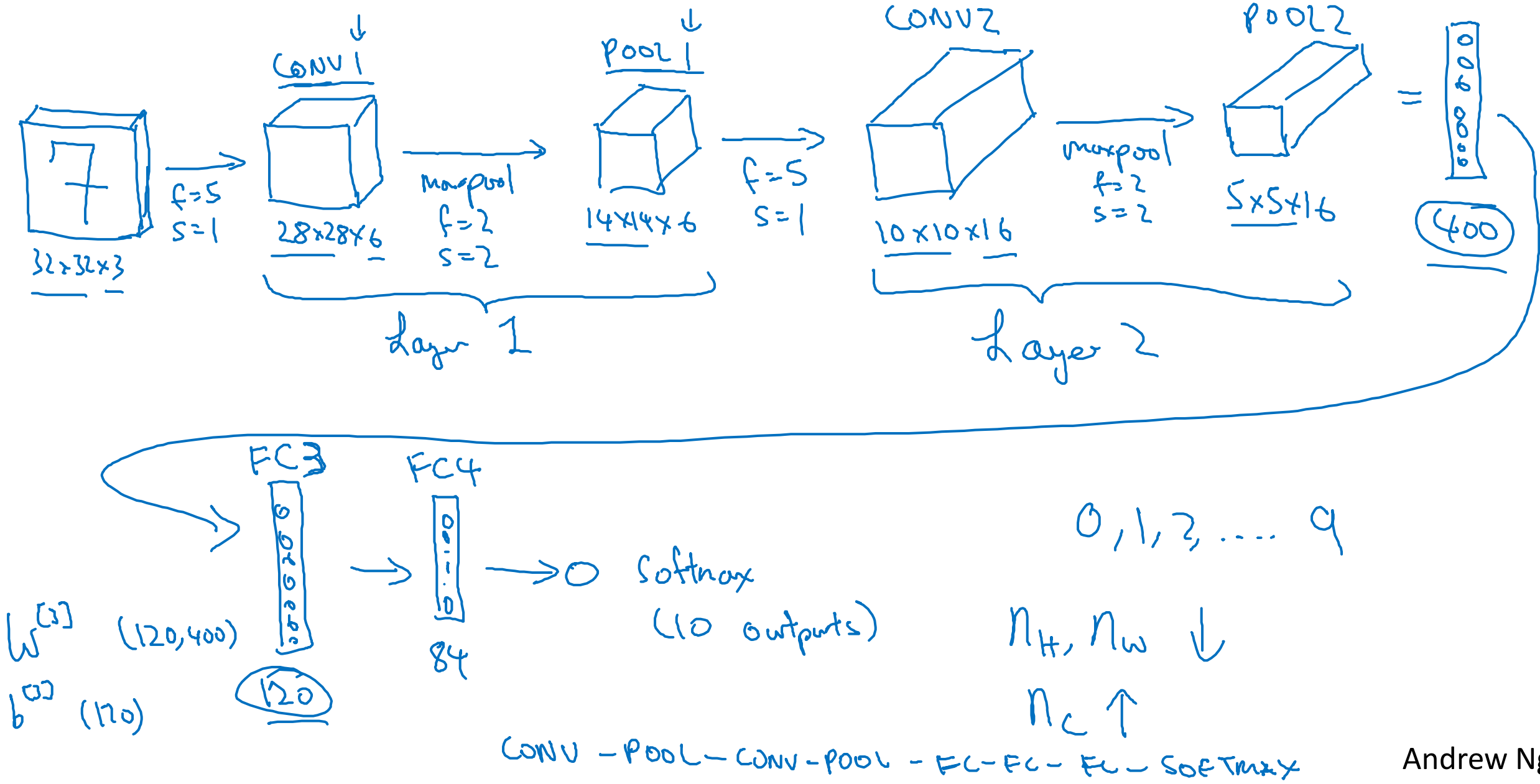deeplearning.ai

Convolutional Neural Networks

Convolutional neural network example

Neural network example (LeNet-5)

CONV1

POOL1

CONV2

POOL2

7

$32 \times 32 \times 3$ $\xrightarrow{\begin{array}{c}f=5\\s=1\end{array}}$ $28 \times 28 \times 6$ $\xrightarrow[\begin{array}{c}f=2\\s=2\end{array}]{maxpool}$ $14 \times 14 \times 6$ $\xrightarrow{\begin{array}{c}f=5\\s=1\end{array}}$ $10 \times 10 \times 16$ $\xrightarrow[\begin{array}{c}f=2\\s=2\end{array}]{maxpool}$ $5 \times 5 \times 16$ = 400

Layer 1

Layer 2

FC3

FC4

120 → 84 → O Softmax (10 outputs)

$W^{[3]}$ (120, 400)

$b^{[3]}$ (120)

$0, 1, 2, \ldots 9$

$n_H, n_W \downarrow$

$n_C \uparrow$

CONV – POOL – CONV – POOL – FC – FC – FC – SOFTMAX

Andrew Ng

Neural network example

	Activation shape	Activation Size	# parameters
Input:	(32,32,3)	3,072 $a^{[0]}$	0

Neural network example

	Activation shape	Activation Size	# parameters
Input:	(32,32,3)	3,072 $a^{[0]}$	0
CONV1 (f=5, s=1)	(28,28,8)	6,272	208
POOL1	(14,14,8)	1,568	0
CONV2 (f=5, s=1)	(10,10,16)	1,600	416
POOL2	(5,5,16)	400	0
FC3	(120,1)	120	48,001
FC4	(84,1)	84	10,081
Softmax	(10,1)	10	841