Convolutional Neural Networks

deeplearning.ai

Convolutional neural network example

Neural network example

(Hand written digit classification)

Conv1

7

32 × 32 × 3

$f=5$
$S=1$
6 filters

28 × 28 × 6

maxpool
$f=2$
$S=2$

Pool 1

14 × 14 × 6

Layer 1

$f=5$
$S=1$
16 filters

Conv2

10 × 10 × 16

maxpool
$f=2$
$S=2$

Pool 2

5 × 5 × 16

Layer 2

Flatten

400 × 1

FC

120

layer 3

$W^{[3]} = (120 \times 400)$
$b^{[3]} = (120)$

Convention
Call something a
Layer If there are
weights involved,
pooling Involves NO
weights ⇒ it is NOT its
own layer

FC

O/p
0 to 9

Softmax
(10 classes)

84

Layer 4

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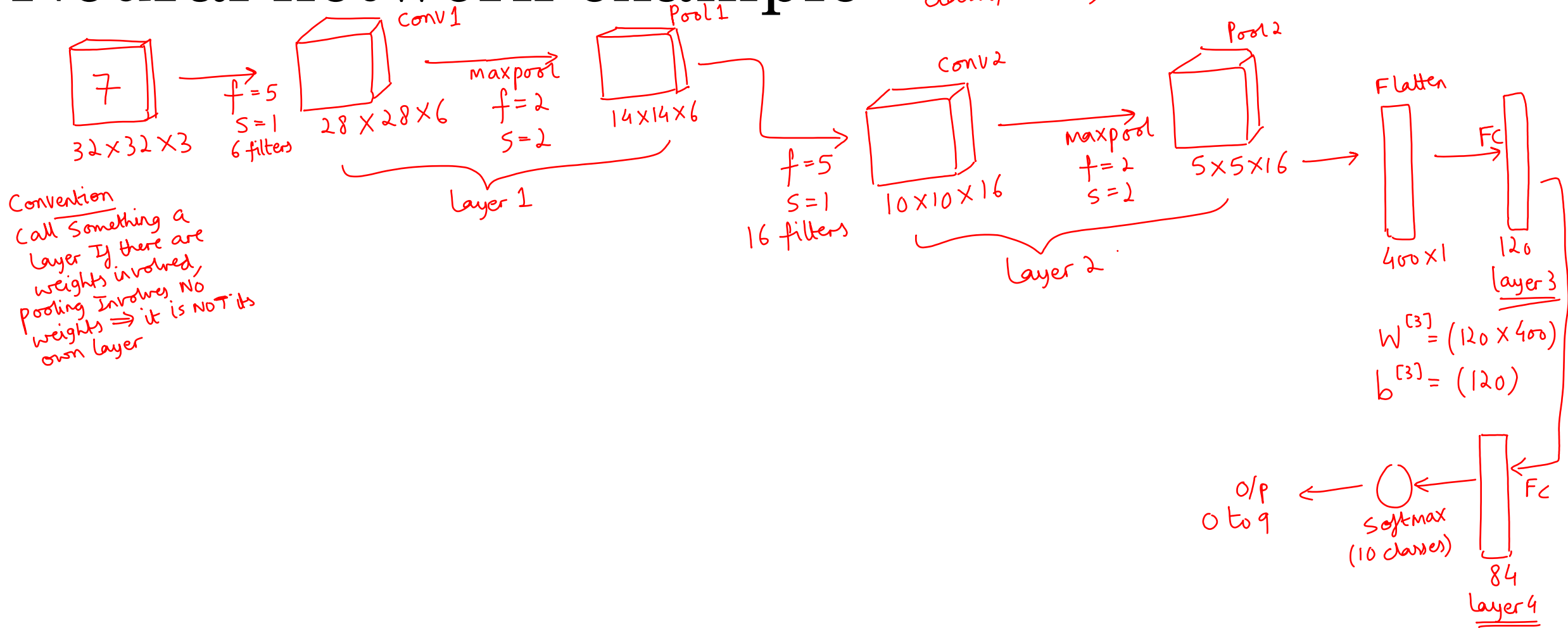
Neural network example

	Activation shape	Activation Size	# parameters
Input:	(32,32,3)	3,072	0
Conv1 (f=5, S=1)	(28×28×8)	6272	(5×5×8) +8×1 (bias) →208 (conv layer has lesser param than FC)
Pool1	(14×14×8)	1568	0 (Pool layers have no params)
Conv2 (f=5, S=1)	(10×10×16)	1600	416 → (5×5×16) #filter + 16×1 (bias)
Pool2	(5×5×16)	400	0
FC3	(120×1)	120	48,001 (400×120)
FC4	(84×1)	84	10,081 (120×84) +1 because of bias
Softmax	(10×1)	10	841

Activation Size ↓

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