Convolutional
Neural Networks

Convolutions over
volumes

deeplearning.ai
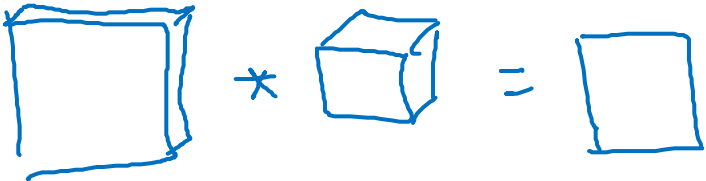
Convolutions on RGB images

$$6 \times 6 \times 3$$

height, width, #channels

$$3 \times 3 \times 3$$
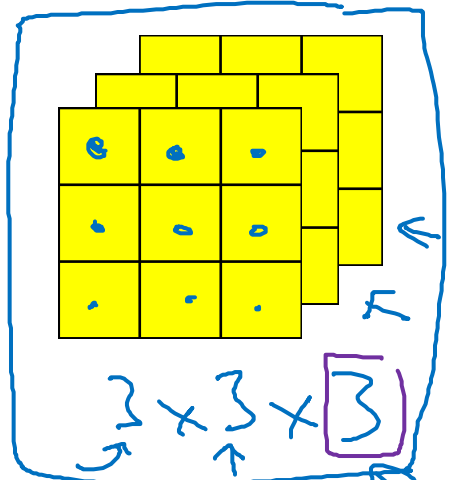
$$= \quad 4 \times 4$$
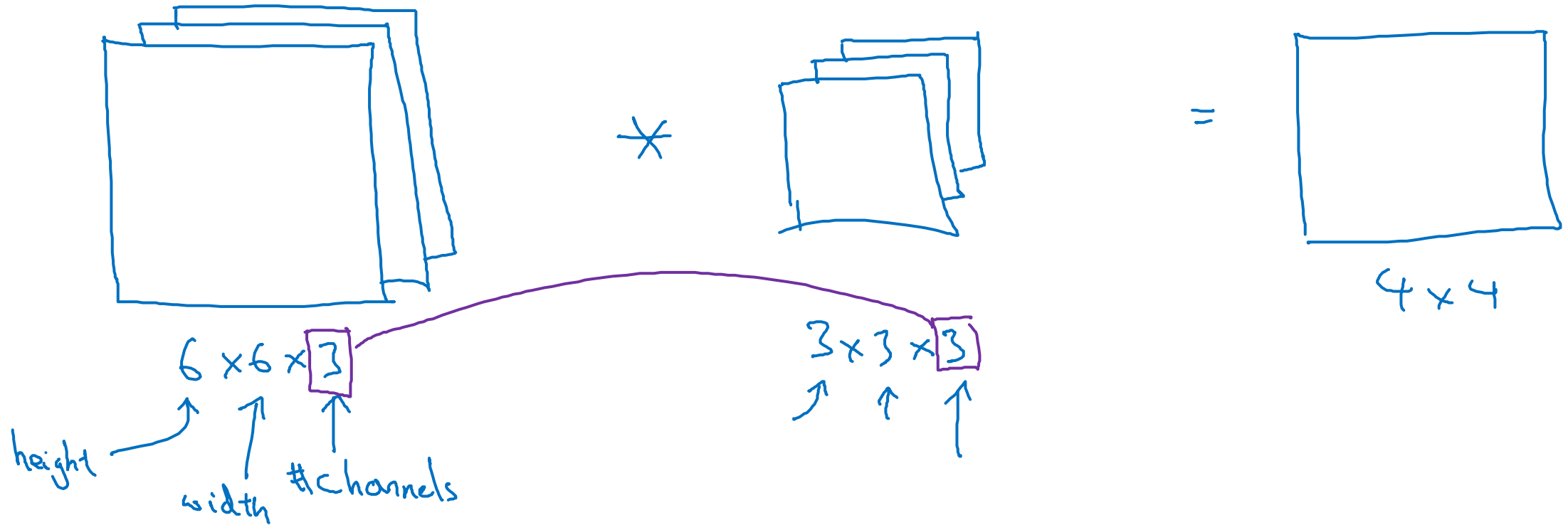
Convolutions on RGB image

$6 \times 6 \times \boxed{3}$

$* $

$3 \times 3 \times \boxed{3}$

27 numbers

R G B

$\rightarrow 3 \times 3 \times 3$

R G B
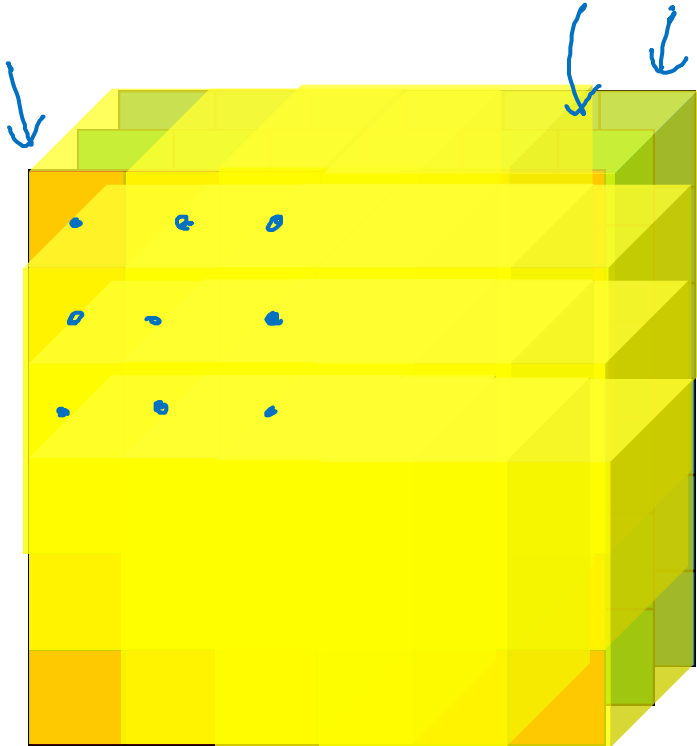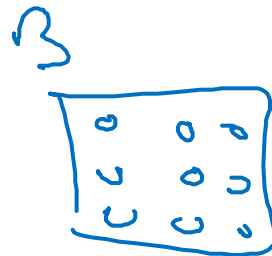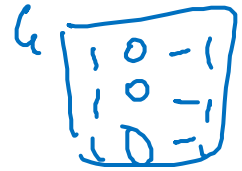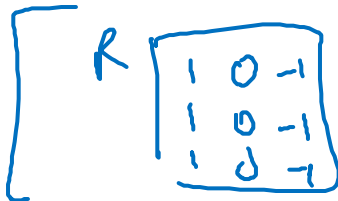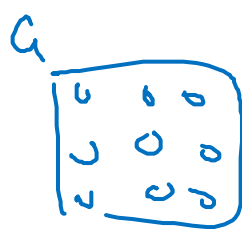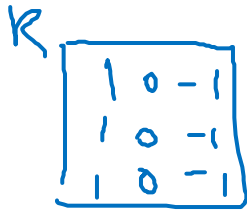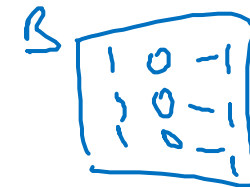
$\rightarrow 3 + 3 + 3$

$=$

4 x 4

Multiple filters

Vertical edge

$*$

3 x 3 x 3

horizontal edge

$*$

3 x 3 x 3

$=$

4 x 4

4 x 4 x 2

4 x 4 x 2

$=$

4 x 4
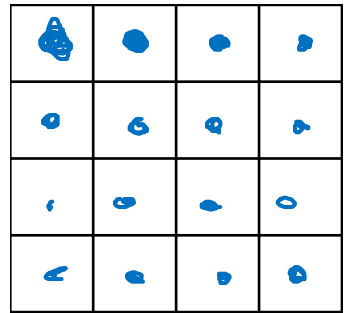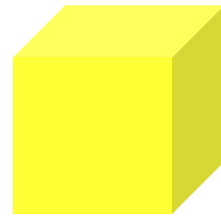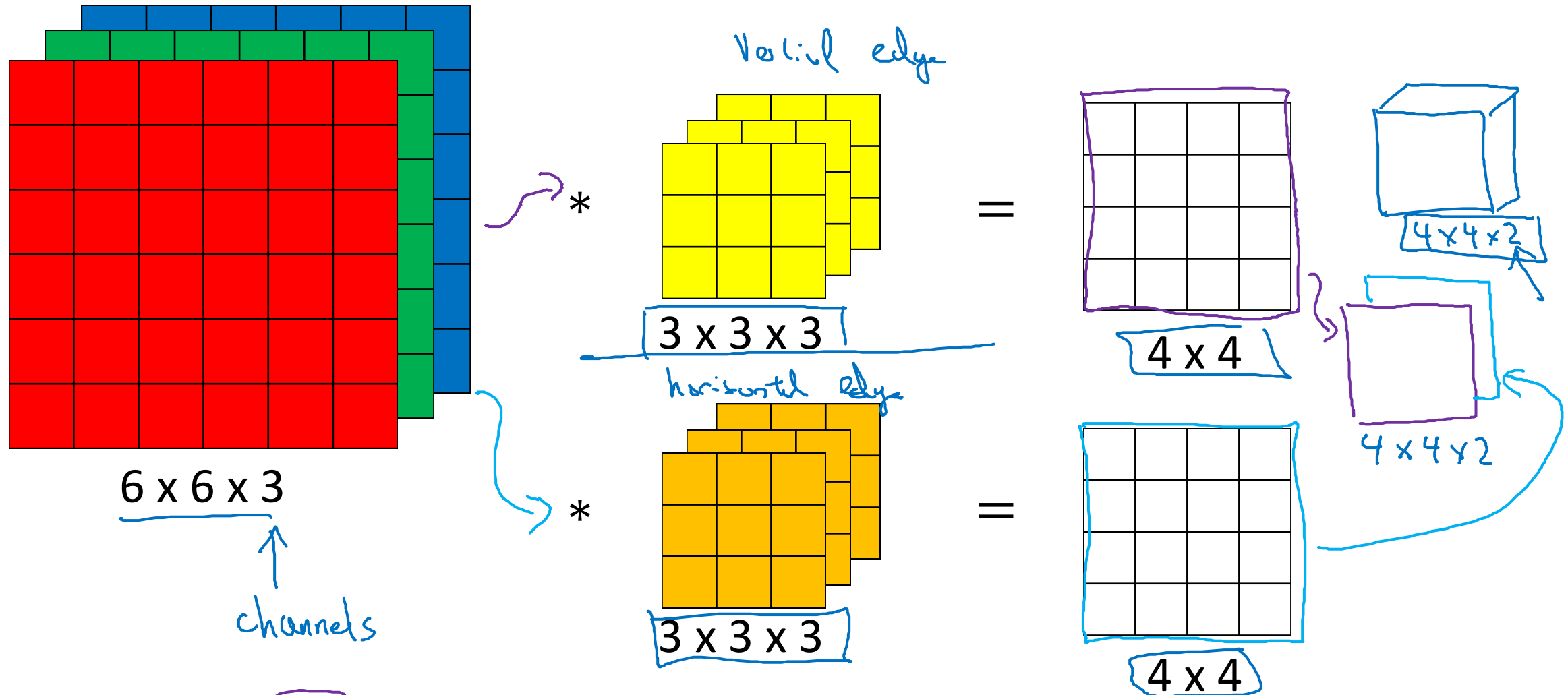
Summary: $n \times n \times \boxed{n_c}$ $*$ $f \times f \times \boxed{n_c}$ $\longrightarrow$ $\frac{n-f+1}{4} \times \frac{n-f+1}{4} \times \underset{\uparrow}{n_c'}$

$6 \times 6 \times 3$ $3 \times 3 \times 3$ $4 \times 4 \times 2$ #filters

6 x 6 x 3

channels

Andrew Ng