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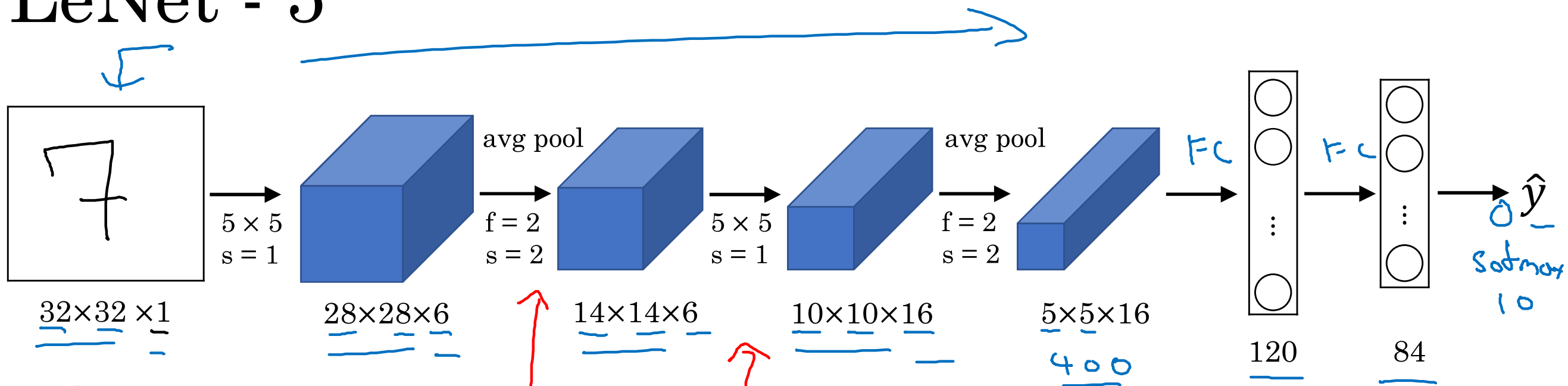
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# Case Studies

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## Classic networks

# LeNet - 5



60K parameters.

$n_H, n_w \downarrow$   $n_c \uparrow$

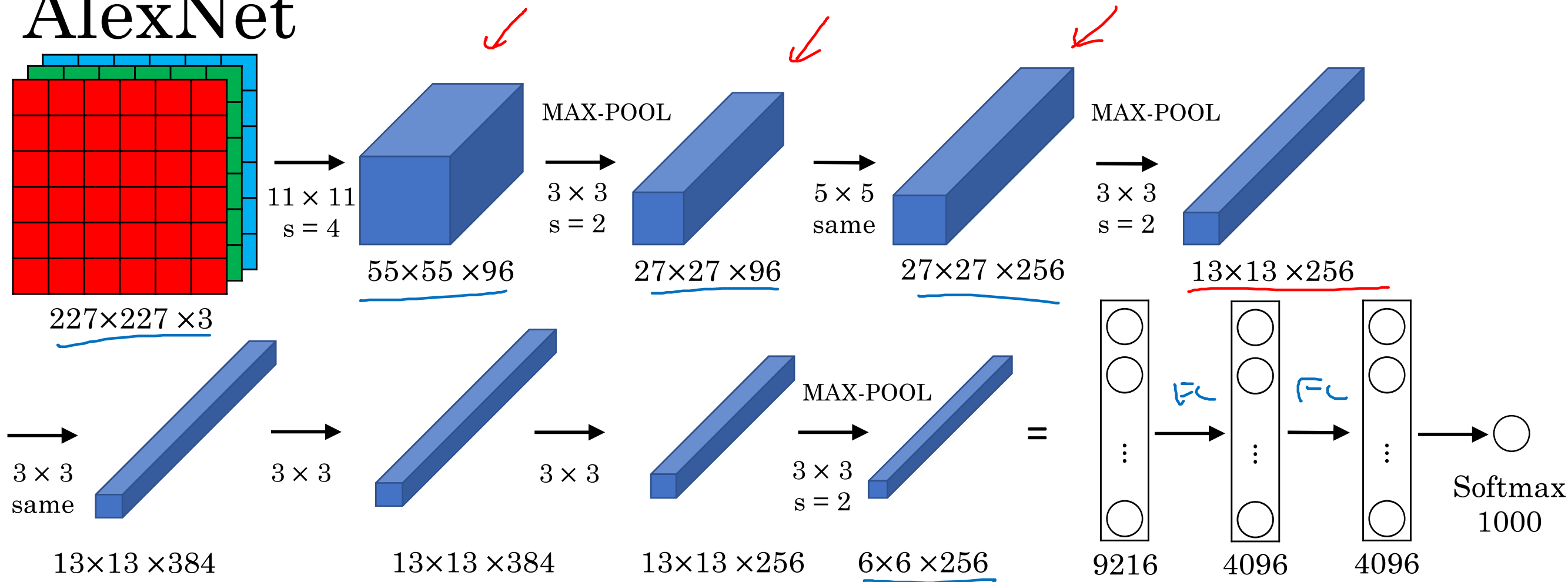
conv pool conv pool fc fc output

Advanced: sigmoid/tanh ReLU

II III



# AlexNet

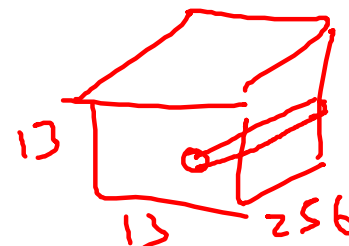


- Similar to LeNet, but much bigger.

- ReLU

- Multiple GPUs.

- Local Response Normalization (LRN)



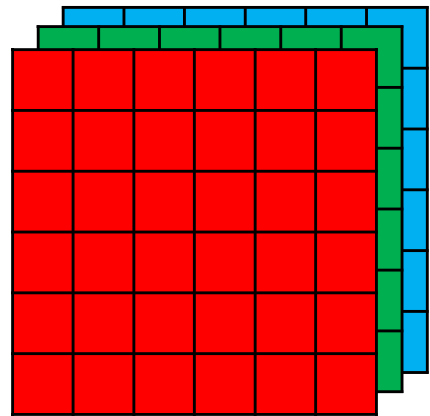
~60M parameters

# VGG - 16

CONV = 3x3 filter, s = 1, same

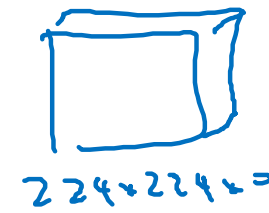
VGG-19

MAX-POOL = 2x2, s = 2



224x224 x 3

$\xrightarrow{[CONV\ 64] \times 2}$  224x224x64  $\xrightarrow{POOL}$  112x112 x 64  $\xrightarrow{[CONV\ 128] \times 2}$  112x112 x 128  $\xrightarrow{POOL}$  56x56 x 128



$\xrightarrow{[CONV\ 256] \times 3}$  56x56 x 256  $\xrightarrow{POOL}$  28x28 x 256  $\xrightarrow{[CONV\ 512] \times 3}$  28x28 x 512  $\xrightarrow{POOL}$  14x14 x 512

$\xrightarrow{[CONV\ 512] \times 3}$  14x14 x 512  $\xrightarrow{POOL}$  7x7 x 512  $\xrightarrow{FC\ 4096}$  FC 4096  $\xrightarrow{FC\ 4096}$  FC 4096  $\xrightarrow{Softmax\ 1000}$  Softmax 1000

$n_H, n_W \downarrow$

$n_C \uparrow$

~138M