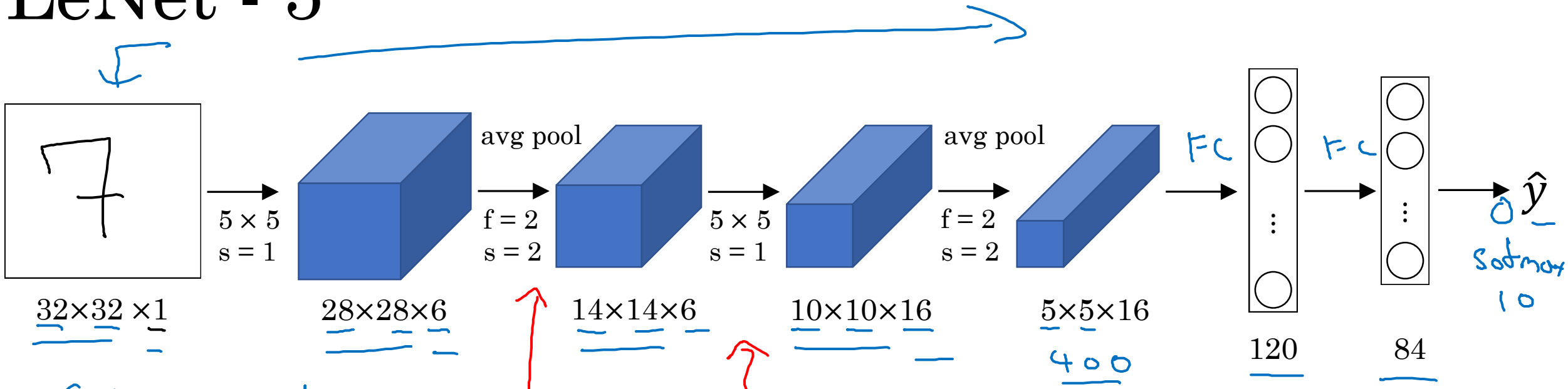
deeplearning.ai

Case Studies

Classic networks

LeNet - 5



60k parameters.

$n_H, n_W \downarrow$ $n_C \uparrow$

Conv pool Conv pool fc fc output

Activation: Sigmoid/tanh ReLU

Nonlinearity after pooling

$n_{H} \times n_{W} \times n_C$ $f \times f \times n_C$

II III

[LeCun et al., 1998. Gradient-based learning applied to document recognition]

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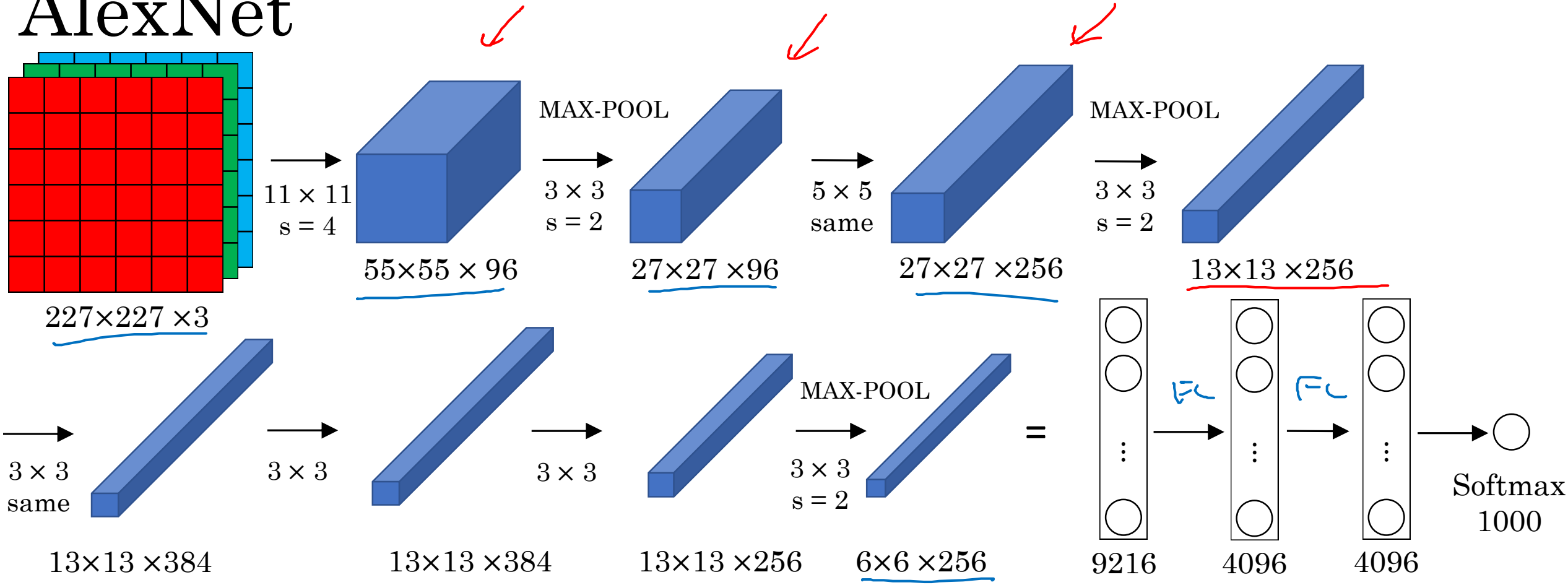
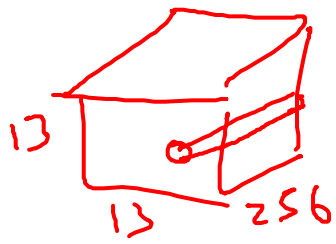
AlexNet



- Similar to LeNet, but much bigger.
- ReLU
- Multiple GPUs.
- Local Response Normalization (LRN)

9216

60M parameters



[Krizhevsky et al., 2012. ImageNet classification with deep convolutional neural networks]

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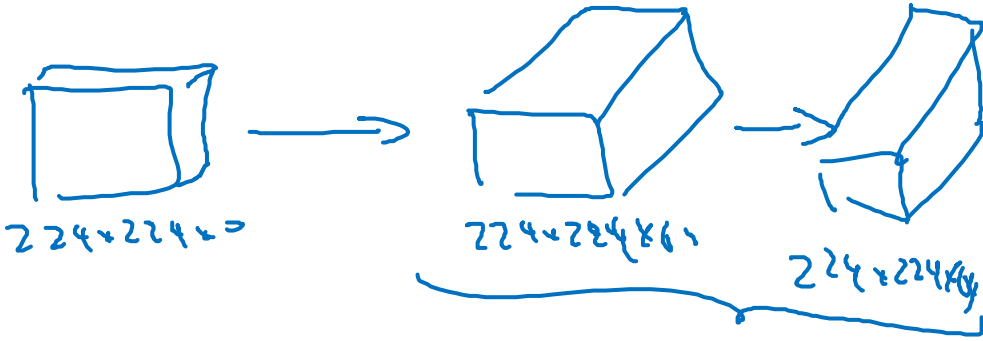
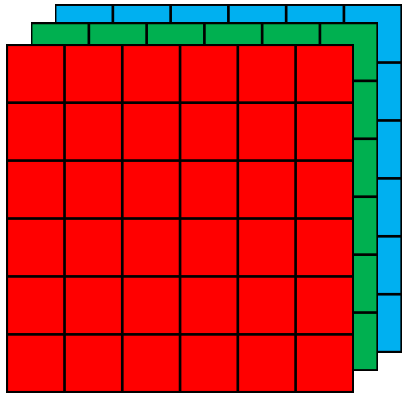
VGG - 16

VGG-19

CONV = 3×3 filter, s = 1, same MAX-POOL = 2×2 , s = 2





224×224 ×3

→ [CONV 64] ×2 → 224×224×64 → POOL → 112×112 ×64 → [CONV 128] ×2 → 112×112 ×128 → POOL → 56×56 ×128

→ [CONV 256] ×3 → 56×56 ×256 → POOL → 28×28 ×256 → [CONV 512] × 3 → 28×28 ×512 → POOL → 14×14×512

→ [CONV 512] ×3 → 14×14 ×512 → POOL → 7×7×512 → FC 4096 → FC 4096 → Softmax 1000

$n_H, n_W \downarrow$ $n_c \uparrow$ ~138M

[Simonyan & Zisserman 2015. Very deep convolutional networks for large-scale image recognition]