One Fourth Labs

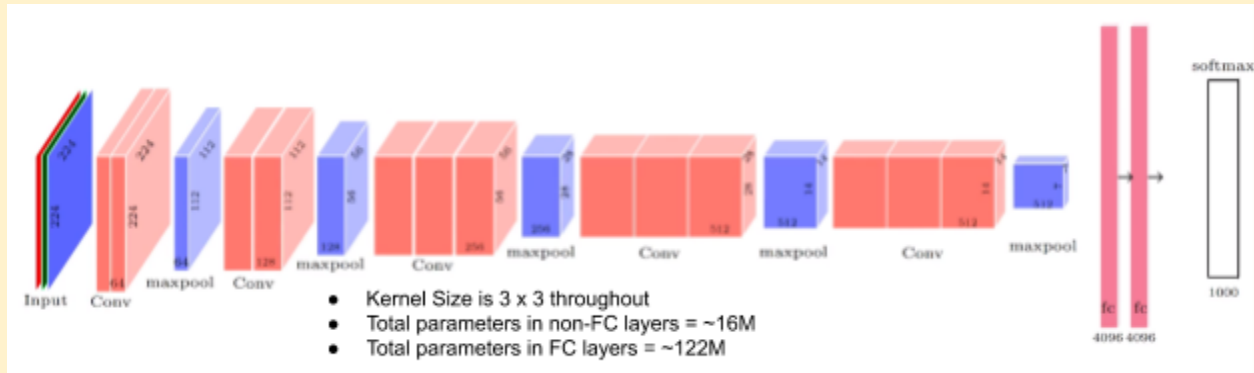
VGGNet

Let's look at the architecture of VGGNet

1. During the design of the VGGNet, it was found that alternating convolution & pooling layers were not required. So VGGnet uses multiple of Convolutional layers in sequence with pooling layers in between.
2. Let us break down the VGGNet architecture

- Kernel Size is 3 x 3 throughout
- Total parameters in non-FC layers = ~16M
- Total parameters in FC layers = ~122M

3. A few points to note
4. The kernel size 3x3 is maintained throughout the network, only the depth is changed between layers
5. Appropriate padding is provided to maintain the dimensions across the layers
6. **Convolutional Bundle 1**: There are **2 convolutional layers** of size **224x224x64**
7. **Max Pool Layer 1**: The size is **112x112x64**
8. **Convolutional Bundle 2**: There are **2 convolutional layers** of size **112x112x128**
9. **Max Pool Layer 2**: The size is **56x56x128**
10. **Convolutional Bundle 3**: There are **3 convolutional layers** of size **56x56x256**
11. **Max Pool Layer 3**: The size is **28x28x256**
12. **Convolutional Bundle 4**: There are **3 convolutional layers** of size **28x28x512**
13. **Max Pool Layer 4**: The size is **14x14x512**
14. **Convolutional Bundle 5**: There are **3 convolutional layers** of size **14x14x512**
15. **Max Pool Layer 5**: The size is **7x7x512**
16. The number of **parameters in the Non-FC layers is ~16 Million**
17. **FC Layer 1** has **4096** Neurons
18. **FC Layer 2** has **4096** Neurons
19. **FC Layer 3** is a softmax with **1000** Neurons/Output-classes
20. The number of **parameters in the FC layers is ~122 Million** (Most in FC Layer 1: ~102 Million)
21. Though the number of parameters in this network seems very large, it would have been exponentially larger if we had chosen an entirely Fully-Connected network.
22. The above shown VGGNet is a 16 layer network called VGG16. There are also other versions like the 19 layered VGG19