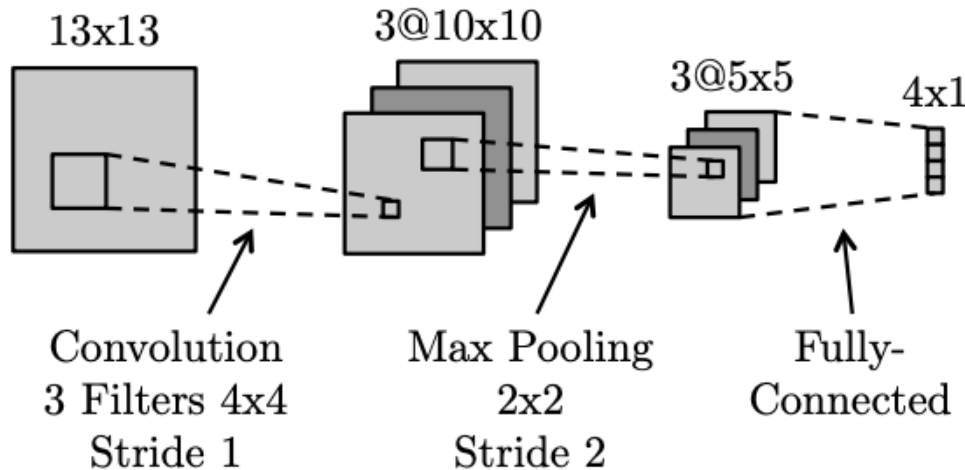


Q1.

Below is a diagram of a small convolutional neural network that converts a 13x13 image into 4 output values. The network has the following layers/operations from input to output: convolution with 3 filters, max pooling, ReLu, and finally a fully-connected layer. For this network we will not be using any bias/offset parameters (b). Please answer the following questions about this network.



- How many weights in the convolutional layer do we need to learn? [2]
- How many ReLu operations are performed on the forward pass? [2]
- How many weights do we need to learn for the entire network? [2]
- Can a fully-connected neural network with the same size layers as the above network can represent any classifier that the above convolutional network can represent? [2]
- What are the disadvantages of a fully-connected neural network compared to a convolutional neural network with the same size layers? [2]