

Exercise 3 :

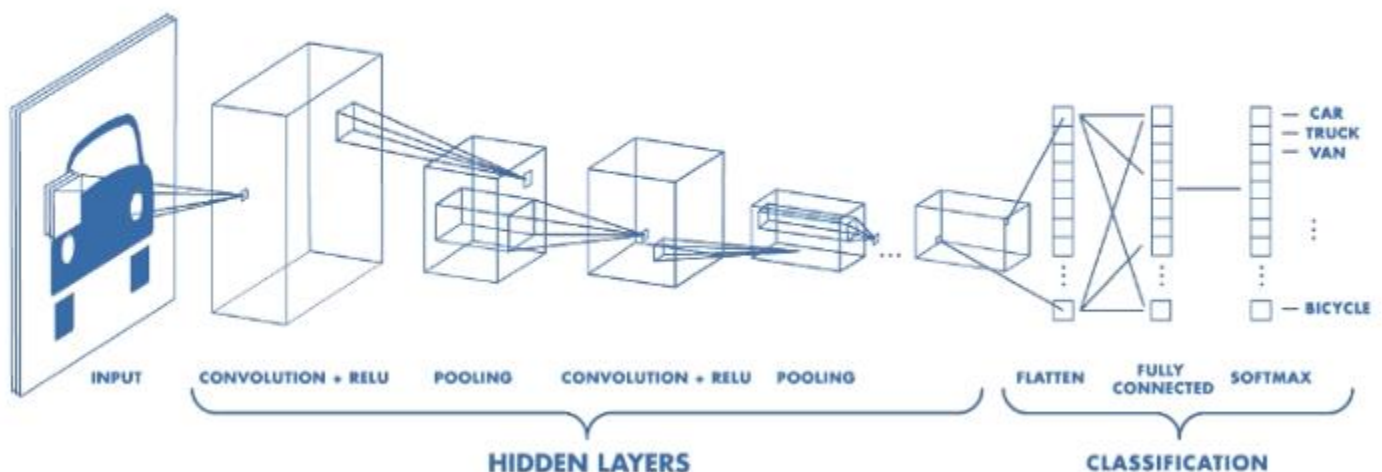
In convolutional neural networks, we have layers called convolutional layers, which by applying one or more filters increase the parameters and dimensions of the data.

Now suppose the number of these convolutional layers increases.

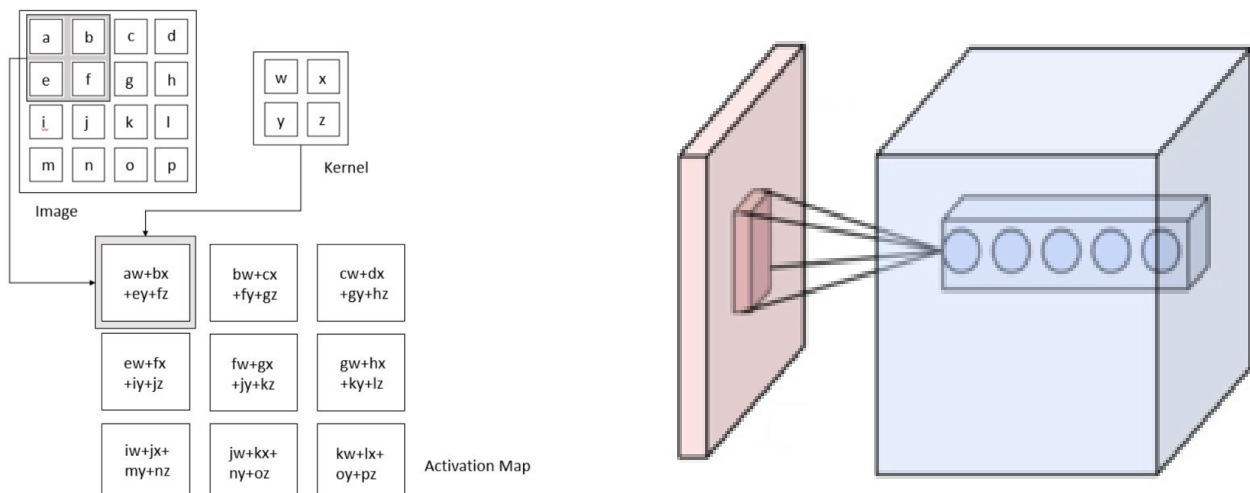
Then the computational cost that will be included in our model will be very high, so it may take months of time to train the data in big data.

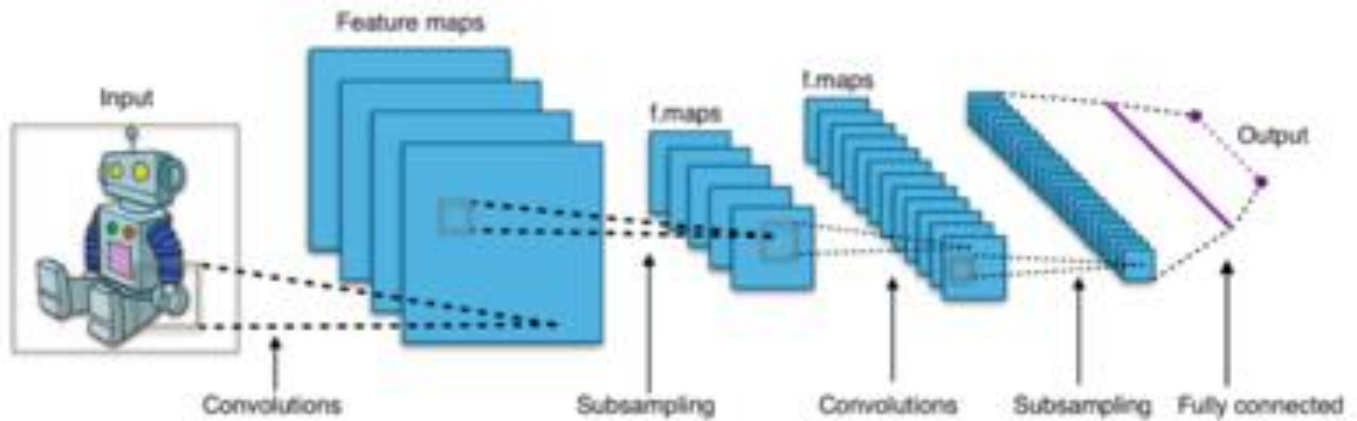
There is also this point, by increasing the applied filters and increasing the parameters as well as the dimensions, it can lead to the problem of overfitting.

To solve this problem, you can use pooling layers such as Maxpooling and Averagepooling, etc. which can be used according to the application and purpose of the model.

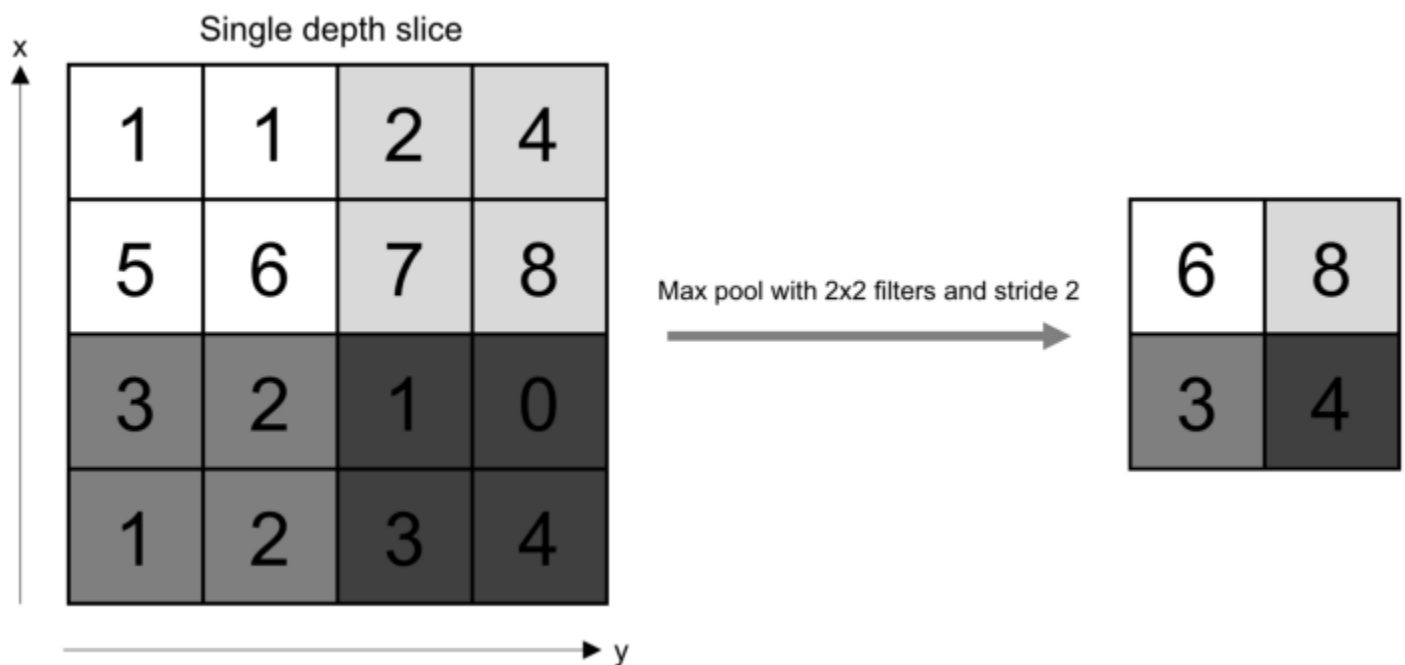


Increasing dimensions and parameters by increasing applied filters in the convolution layer :





By adding the pooling layer, we reduce these dimensions and parameters. But there may be problems with it. One is that if we don't have zero padding, we will lose the corner parts of the photo. And the important information we need may be in the corner of the photos, in this case, by losing important data, our model will not be trained properly.



So the use of pooling can be very useful and practical, provided that it is not used frequently, because as mentioned, it may cause problems with the loss of vital data. On the other hand, pooling displays the general details of the photo, which is the center of the photo in maxpooling, in smaller dimensions and parameters, so its repetition may take away attention and importance from the main part. Using proper padding may not be effective, so it should be used in different contexts and in the right place by knowing the application and principles of each pooling. Even big models use pooling nowadays. The correct use of these depends on experience in addition to knowledge.