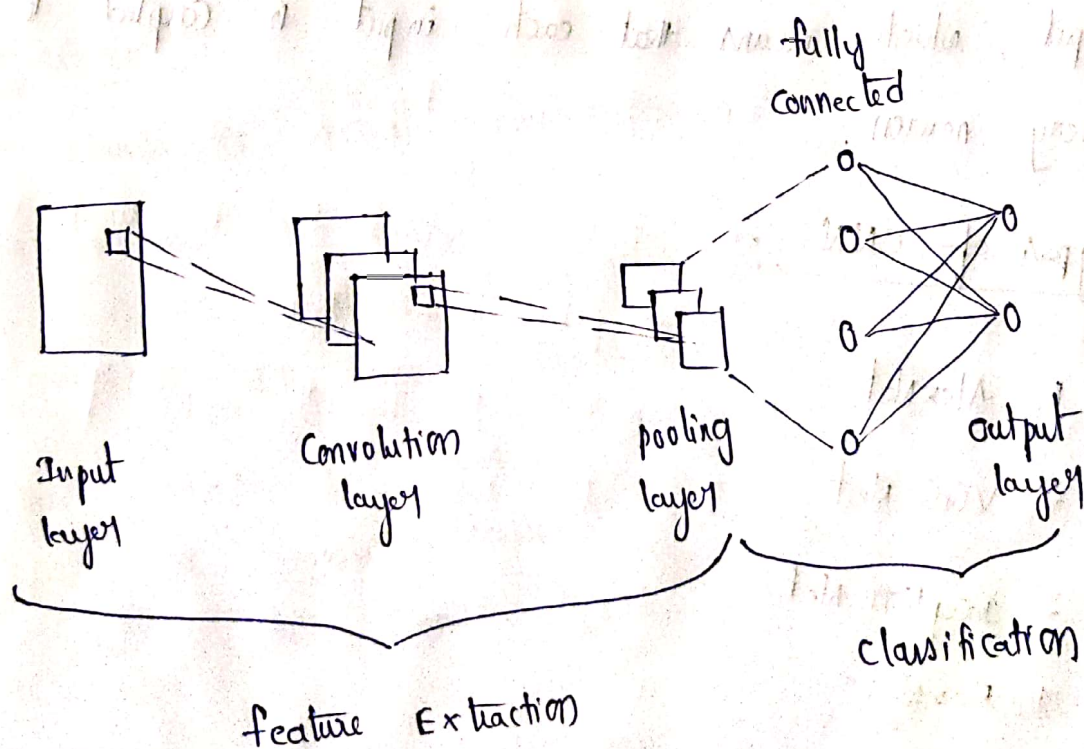


CNN - Convolutional Neural Networks

- CNN are a type of multi-layer neural network that is meant to discern visual patterns from pixel images.
- In CNN, convolution is referred to as the mathematical function.
- CNN cannot function without convolutional layers.
- A convolutional neural network is made up of numerous layers, such as:
 1. pooling layers
 2. convolution layers
 3. fully connected layers
 4. input output layers.

CNN Architecture



Convolutional Layer :

→ They are the foundation of CNN, and they are in charge of executing convolution operations.

→ The kernel is the component in this layer that performs the convolution operation (matrix).

pooling Layer :

→ This layer is in charge of reducing dimensionality.

→ pooling layer is divided into 2 types

1. Maximum pooling
2. Average pooling

Fully Connected Layer :

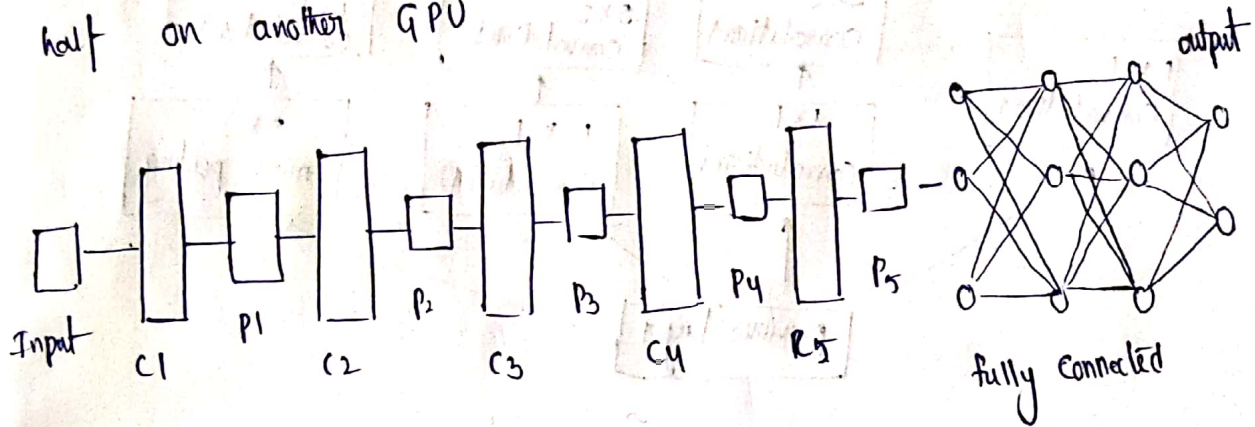
→ The fully connected layer (FC) works with a flattened input, which means that each input is coupled to every neuron.

Type of CNN :

1. AlexNet
2. VGG Net
3. Inception Net
4. ResNet

1. Alex Net

- Alex Net has 8 layers with learnable parameters
- This model has 5 convolution layers and 3 fully connected layers.
- AlexNet allows for multi-GPU training by putting half of the model's neurons on one GPU and the other half on another GPU.



C - convolution layers
P - pooling layers.

2. VGG Net

→ it stands for visual geometric graph

→ VGG 16 has 16 layers

- i) 13 convolution layers
- ii) 3 fully connected layers

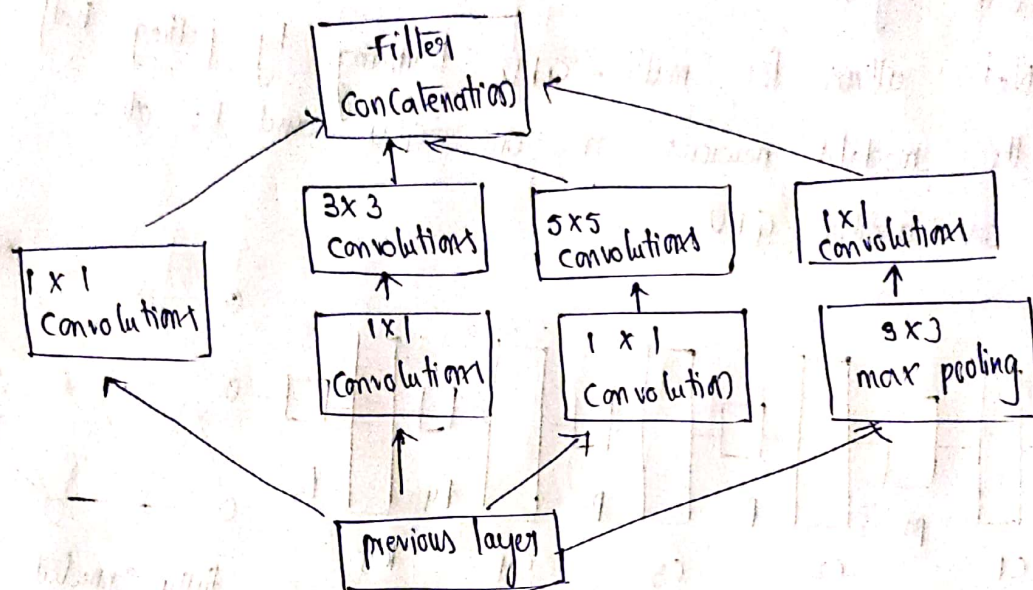
→ VGG 19 has 19 layers

- i) 16 convolution layers
- ii) 3 fully connected layers.

→ The VGG architecture is the basis of ground-breaking object recognition models.

3. Inception Net :

- Inception Net also known as GoogLeNet.
- Inception Net uses the Inception module



4. ResNet :

→ ResNet has 34 layers

- 31 convolution layers
- 3 fully connected layers

- ⇒ ResNet is a powerful backbone model that is used very frequently in many computer vision tasks.
- ResNet uses skip connection to add the output from an earlier layer to a later layer.