**1. What do you mean by Convolutional Neural Network?**

A **Convolutional neural network (CNN, or ConvNet)**is another type of neural network that can be used to enable machines to visualize things.

## 2. Why do we prefer Convolutional Neural networks (CNN) over Artificial Neural networks (ANN) for image data as input?

**1.** Feedforward neural networks can learn a single feature representation of the image but in the case of complex images, ANN will fail to give better predictions, this is because it cannot learn pixel dependencies present in the images.

**2.** CNN can learn multiple layers of feature representations of an image by applying filters, or transformations.

**3.Explain the different layers in CNN.**

The different layers involved in the architecture of CNN are as follows:

**1.** **Input Layer:**The input layer in CNN should contain image data. Image data is represented by a three-dimensional matrix. We have to reshape the image into a single column.

**For Example,**Suppose we have an MNIST dataset and you have an image of dimension 28 x 28 =784, you need to convert it into 784 x 1 before feeding it into the input. If we have “k” training examples in the dataset, then the dimension of input will be (784, k).

**4. Explain the significance of the RELU Activation function in Convolution Neural Network.**

**RELU Layer –** After each convolution operation, the RELU operation is used. Moreover, RELU is a non-linear activation function. This operation is applied to each pixel and replaces all the negative pixel values in the feature map with zero.

Usually, the image is highly non-linear, which means varied pixel values. This is a scenario that is very difficult for an algorithm to make correct predictions.

## 5.Why do we use a Pooling Layer in a CNN?

CNN uses pooling layers to reduce the size of the input image so that it speeds up the computation of the network.

**Pooling or spatial pooling layers:**Also called **subsampling** or **downsampling**.

* It is applied after convolution and RELU operations.
* It reduces the dimensionality of each feature map by retaining the most important information.
* Since the number of hidden layers required to learn the complex relations present in the image would be large.

As a result of pooling, even if the picture were a little tilted, the largest number in a certain region of the feature ma