Convolutional Neural Network

Task1: Create a Convolutional Neural Network with the following specifications for MNIST dataset.

- The input image of 28x28 is processed in the first convolutional layer using the filter-weights. This results in 16 new images, one for each filter in the convolutional layer. The images are also down-sampled so the image resolution is decreased from 28x28 to 14x14.

- These 16 smaller images are then processed in the second convolutional layer. We need filter-weights for each of these 16 channels, and we need filter-weights for each output channel of this layer. There are 36 output channels so there are a total of 16 x 36 = 576 filters in the second convolutional layer. The resulting images are down-sampled again to 7x7 pixels.

- The output of the second convolutional layer is 36 images of 7x7 pixels each. These are then flattened to a single vector of length 7 x 7 x 36 = 1764, which is used as the input to a fully-connected layer with 128 neurons (or elements). This feeds into another fully-connected layer with 10 neurons, one for each of the classes, which is used to determine the class of the image, that is, which number is depicted in the image.

  Use padding same for convolutions and max pooling of 2x2 as it will divide the image into half.

  Report the accuracies of the network on validation and test set. Plot few prediction showing the resutls of true and false pridictions

Use any language and framework of your choice but keras and tensorflow are with notebook is preferred.