Date: March 30, 2022   **Deadline: April 10, 2022**

- **Do not copy** and paste or cheat. Assignments are for your learning not just to solve by copying.
- **Prepare 5** minutes to demo video explaining or code or observation. In any case video should not be longer than 7 minutes. Naming convention - ubitname_a3.zip (ex: sachinge_a3.zip)

Use the CIFAR-10 dataset for the questions. Perform the image classification using the dataset based on the network configuration defined in the individual part.
(train_images, train_labels), (test_images, test_labels) = datasets.cifar10.load_data()

If possible, build a network, else provide the reason why the network cannot be built. Build the network with the maximum depth possible if in any case, you cannot build the network. For instance, suppose we have asked you to build a network of N layers and you are not able to build that, then build 'M' (M < N and should be as close as possible to N).

1. Built 7 convolutional layers CNN with 16 filters in the first two layers, 32 filters in the next pair of conv layers, 64 in the next pair, and 128 in the final conv layer. After that any number of dense layers you can apply. After each pair of convolutional layers and the final conv layer, you need to apply pooling with filter size (2*2). Filter size in the convolutional layers can be fixed to (3*3).

   1a. The network should not use any padding
   1b. With padding

2. Built the network defined in Q. 1 without a pooling layer.

3. Increase the number of filters in each layer by a factor of 2.

Analyze the behavior of each CNN with respect to accuracy, loss, training & testing time. Along with this visualization of the CNN activation/filter maps, etc.

https://blog.keras.io/how-convolutional-neural-networks-see-the-world.html
https://deeplizard.com/learn/video/cNBBNAxC8l4