

## Assignment 2

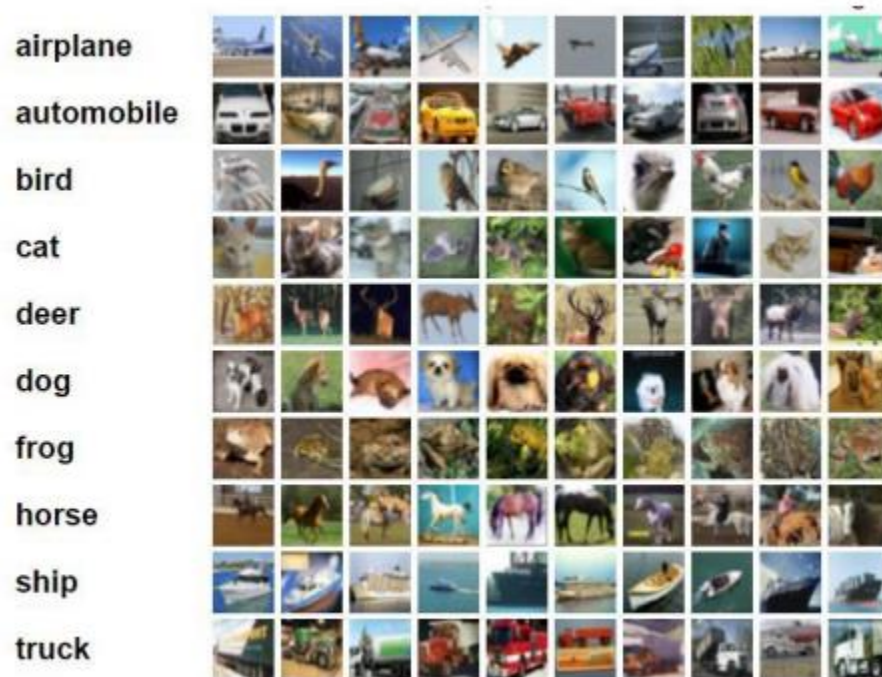
### Applying ANN for Image classification

In this problem set we want to use PyTorch to train neural network-based image classifier. You will be using CIFAR-10 dataset to train and evaluate your model.

## 1 CIFAR-10 Dataset

The CIFAR-10 dataset consists of 60,000 32x32 color images in 10 classes, with 6000 images per class. The classes are completely mutually exclusive. There is no overlap between automobiles and trucks. "Automobile" includes sedans, SUVs, things of that sort. "Truck" includes only big trucks. Neither includes pickup trucks.

Here are the classes in the dataset, as well as 10 random images from each:





## 2 Requirements

1. You will build ANN with 3 hidden layers as follows:

- First hidden layer will be 4096 units.
- Second hidden layer will be 2048 units.
- Third hidden layer will be 512 units.

Then you will evaluate model using the test set.

2. You will use transfer learning to train 3 models using the given dataset and evaluate them. These models use CNNs.

The pretrained models are:

- VGG16
- GoogleNet
- Resnet50

3. Compare the output models with ANN using confusion matrix, accuracy, precision, recall and comment on their results.

## 3 Report Requirements

- For all the requirements mentioned above you should report the model accuracy, precision, recall and F-score as well as the resultant confusion matrix using the testing data.
- Your comments on all results and comparisons.
- Output for some test images for each model.

## 4 Bonus

You can do one of the following:

- The report is done in Latex.
- Build another ANN with 2 and 4 hidden layers and compare it with other models (must be included also in the report).



## 5 Deliverables

You are required to deliver the following:

- Your code.
- Report

## 6 Notes

- You should write your code in python.
- You will need to use PyTorch libraries.
- You should work with groups of 3.