Problem definition

We will be using CIFAR-10 dataset. The dataset comprises 60000 color images with a resolution of 32×32, separated into 10 classes (airplane, automobile, bird, cat, deer, dog, frog, horse, ship, truck), with 6000 images per class. It is already split into 6 batches with 10000 images each.

Therefore, this is a classification problem with 10 classes.

Problem specification

To solve the classification problem, we will use a supervised learning algorithm, more specifically, a softmax classifier.

Input: vectorized version of the image: 32*32*3=3072 feature vector

Output: 10 values representing class probabilities

Specification of the learning task

Task: 10 class classification

Performance: accuracy, precision, recall, f-score, specificity, AUC

Experience:

- Direct
- Teacher: Labeled data
- The training experience is representative for the performance goal

Brief description of the ML technique

In order to solve this problem, we will be using a simple softmax classifier which is similar to the perceptron, only that there are 10 outputs, hence there are 10 perceptrons. The softmax classifier learns through stochastic gradient descent.