

**CIFAR-10 – Bayesian classifier (better)** (20 points)

Screenshot that summaries the results:

The screenshot shows a code editor with Python code for loading and processing CIFAR-10 data, and a terminal window displaying the results of a Bayesian classifier.

```

16 trainDataDict = unpickle(root+'cifar-10-batches-py/data_batch_1')
17 trainX=trainDataDict["data"].reshape(10000, 3, 32, 32).transpose(
18 trainY=np.array(trainDataDict["labels"])
19 for i in range(2,6):
20     fn='cifar-10-batches-py/data_batch_%i'%i
21     trainDataDict = unpickle(root+fn)
22     tx=trainDataDict["data"].reshape(10000, 3, 32, 32).transpose(
23     #print(tx.shape)
24     ty=np.array(trainDataDict["labels"])
25     trainX=np.concatenate((trainX,tx))
26     trainY=np.concatenate((trainY,ty))
27
28     #print("training set size:", trainX.shape)
29     return trainX, trainY
30
31 def load testset():
32     testDataDict = unpickle(root+'cifar-10-batches-py/test_batch')
33     testX = testDataDict["data"].reshape(10000, 3, 32, 32).transpose(
34     testY = np.array(testDataDict["labels"])

```

Line 22, Column 72

```

Naive Bayes classifier Classifying...
32x32 Gaussian Bayes-classifier accuracy: 36.230000000000004%
32x32 Gaussian Naive Bayes-classifier accuracy: 29.759999999999998%
Total running time: 618.9189963340759s
Bayes classifier accuracies: [24.79, 31.05, 40.22, 41.73, 43.46, 36.23]
Naive Bayes classifier accuracies: [19.54, 22.52, 26.04, 28.59, 29.48, 29.76]
Gtk-Message: 01:46:27.735: Failed to load module "appmenu-gtk-module"
[tuomas@localhost Ex3]$ python task2.py
Estimating model parameters...
Evaluating model accuracy...
Gaussian Bayes-classifier accuracy: 24.79 %.
[tuomas@localhost Ex3]$

```

Search and Replace Current Project Terminal

So the accuracy that I got for Bayesian classifier and 1x1 images were 24.79%. Slightly better than Naive Bayes implementation, where we assumed that values of color channels (rgb) were independent of each other (which clearly is not the case in real applications).