Assignment 3

BITS F464 (Machine Learning)

Due on 25/04/2019

1. Neural Networks

- The data is images of Dogs and Cats in RGB format. Your task is to be able to classify them as such.
- Preparing the dataset - Convert the RGB images into 50x50 greyscale images (Y' = 0.2989 R + 0.5870 G + 0.1140 B) You may utilize a library for this task or do it on the fly

- The following functions must be implemented for ease of evaluation
  - initialize(): Randomize all incoming weights to values chosen uniformly between -1 and 1
  - computeActivation(): Apply sigmoid function to weighted sum of inputs
  - computeError(): Compute error for the output node
  - computeWeightChange(): Calculate the current weight change
  - updateWeights(): Update changes to weights for this pattern
  - feedforward(): Present input and compute activations for rest of net
  - train(): Train the net according to the current training parameters, and output important information as you train
  - backpropogate()

- The algorithm must be coded from scratch. Also, note that a high accuracy is not the goal for this exercise (Image classification is generally performed with CNNs). It is purely a learning oriented exercise and correct implementations are what is expected.

- Present the results in your report along with confusion matrices. Contrast the performance with respect to 0 hidden layers (equivalent to logistic regression), and at least two more configurations of number of hidden layers.

Please find the dataset here: https://www.kaggle.com/c/dogs-vs-catsredux-kernels-edition/data

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