

Assignment 4: On your own

Welcome to your final assignment. In this assignment you will not have a half finished script to work on but must write your own pre-processing and evaluation. You must choose one of two possible datasets to work on and you are free to use any type of neural network you like. Upload the completed script `assigmnnet.py` and the document `assignment.pdf` to the VLE before the deadline.

Standard criteria for valid assignments

In general, an assignment is considered valid if the following criteria are met:

- The delivered program uses Python and Tensorflow.
- Only one code file is used. You should also provide a PDF with screenshots displaying the final accuracy of the model together with any charts created.
- The way the final test error is calculated as classification accuracy.
- Only the provided dataset is used and without modification (although the data may be transformed for use by the model).
- Your program may not run for longer than 10 minutes on CPU.
- The delivered program code is organised and easy to understand.
- The delivered program does not use any random number generator seeds.
- When the delivered program is run, the data is pre-processed, the model is trained from scratch using gradient descent (or an extension of gradient descent), and the trained model is evaluated on the test set.
- The test set does not influence training in any way.
- Your aim should be to deliver the fastest, smallest, and best performing program possible with the given task constraints.

You will get marks for:

- Neatness.
- Using correct implementations of techniques shown in class.
- Use of sensible hyperparameters.
- Use of regularisation.
- The model's general performance.
- Any interesting ideas you include (for bonus marks).

Option 1: CIFAR10 (image classification)

Summary: Learn a neural network that recognises objects in images.

You are provided with 32x32 RGB images, each of which is one of 10 possible classes. Train a neural network to classify the class of the images.

Constraints

This task in particular is considered valid if the following criteria are met:

- Use a neural network.

Option 2: Reuters (text classification)

Summary: Learn a neural network that identifies the topic of a new article.

You are provided with news articles (one per line in text.txt) using a variable number of words separated by spaces (no need to perform any complex word splitting), each of which is one of 5 possible classes. Train a neural network to classify the class of the texts.

Constraints

This task in particular is considered valid if the following criteria are met:

- Use a neural network.