

Lab 8: Training on the linear dataset

Lab 8: Training on the linear dataset Ungraded, 100 Possible Points

Due: Tue May 9, 2023 8:30am5/9/2023

100 Possible Points

Attempt

Attempt 1



SUBMITTED on May 4,
2023 10:55am5/4/2023

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Assignment

In this week's lab, you will write a client training loop to train and evaluate the accuracy a network on the linear dataset.

Incorporate your instructor's feedback

If you receive feedback from the instructor on the previous week's lab in a timely manner, incorporate that feedback into your derivations and implementation for this week's lab.

Copy the base client.py file

Copy the file into your working directory for this lab:

```
cp /data/cs3450/mlp_from_scratch/week6/client.py .
```

If you reuse code from previous labs, **be sure** you do not call `backward()` or any other torch autograd features anywhere in the code you reuse!

Implement the training loop

Write a client that sets up a network using your library, creating and connecting the nodes to each other and telling your library what order the nodes should be

for the main training loop.

Implement stochastic gradient descent with batches. Add a loop to **client.py** to perform as many epochs over the training data as seems reasonable to you.

Train and test on a simple 2d dataset

Test your algorithm with the simple linear data produced by **create_linear_training_data**. You may find it helpful to test it with the data created by the **create_folded_training_data** as well. Two or three hidden nodes should be sufficient for these smaller datasets, which will also help with debugging.












In-lab checkoff

Demonstrate a working stochastic gradient descent loop for your library. The loop should train, weights should change, but the error doesn't need to go down yet.

Submissions

In a comment at the end of the client.py file, copy-paste the output of your program's MSE and $M @ W$ matrix ($@$ is the matrix-multiplication operator.) The MSE should be near zero, and the $M @ W$ matrix should be near the rotation matrix described in Lab 3.

Submit your client.py, along with all the .py files on which it depends and latest (and still passing) test_*.py files. Submit the files individually to Canvas, NOT in a zip.

Uploaded files		test_linear-2.py	
File Name		Size	
	test_linear-2.py	test_linear-2.py	1.39 KB ✓
	test_relu-2.py	test_relu-2.py	1.01 KB ✓
	layers-2.py	layers-2.py	15 KB ✓
	network-2.py	network-2.py	3.24 KB ✓
	test_network-2.py	test_network-2.py	2.09 KB ✓
	test_mseloss-2.py	test_mseloss-2.py	1.17 KB ✓
	test_sum-2.py	test_sum-2.py	1.43 KB ✓
	client.py	client.py	10.7 KB ✓
	test_softmax-2.py	test_softmax-2.py	1.46 KB ✓
	test_regularization-2.py	test_regularization-2.py	1.18 KB ✓
	test_layer-3.py	test_layer-3.py	1.43 KB ✓
	test_input-2.py	test_input-2.py	1.07 KB ✓

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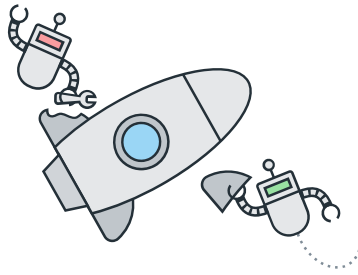
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