Labs
Machine Learning Course
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Problem Set 12, Dec 13, 2018 (PyTorch Introduction)

Goals. The goal of this exercise is to

- introduce you to the PyTorch platform.

1 PyTorch Getting Started

Tutorials. Installation instructions:

pytorch.org

We recommend using the following online tutorial:

pytorch.org/tutorials/beginner/pytorch_with_examples.html

Setup, data, and sample code. Obtain the folder `labs/ex12` of the course github repository

github.com/epfml/ML_course

Exercise 1: Torch Familiarize yourself with the basics of pytorch through the tutorial.

Exercise 2: Basic Linear Regression

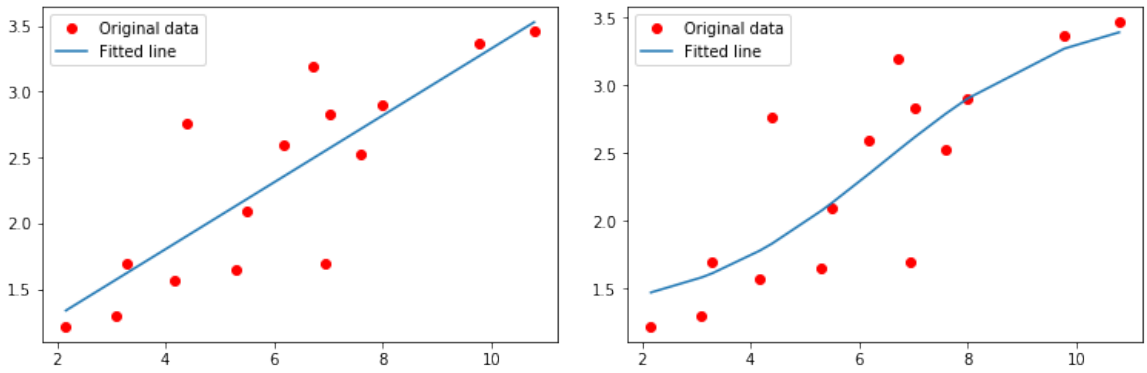
- Implement prediction and loss computation for linear regression in the `MyLinearRegression` class.
- Implement the gradient descent steps in the `train` function.
- **HINT:** don't forget to clear the gradients computed at previous steps.

Your output should be similar to that of Fig. 1, left.

Exercise 3: NN package

- Re-Implement Linear Regression using the routines from the `nn` package for defining parameters and loss in the `NNLinearRegression` class. Does the result that you obtain differ from the previous one? If so, why?
- Combine two linear layers and a non-linearity (sigmoid or ReLU) layer to build a Multi-Layer Perceptron (MLP) with one hidden layer, in the `MLP` class. Find the optimal hyper-parameters for training it.

Your prediction using the MLP should be non-linear, and for a hidden size of 2 might look like Fig. 1, right.



(a) Prediction with linear regression

(b) Prediction with MLP

Figure 1: Predictions made by various trained models.