

Exercise 1:

Go to <https://www.kaggle.com/t/f8eadb8074fb4921805f8d756056fe10> where you'll find a small deep learning competition for our lecture. The data looks similar to the MNIST example you've seen in the lecture. Train a deep neural network on the training data `train.csv` and predict `test.csv`. Upload a csv file with the predictions and ids to get your score and place on the leaderboard.

Good Luck!

Exercise 2:

Implement the perceptron as introduced in the lecture. Use the delta-update rule for training. Train the perceptron on the `Sonar` dataset from the `mlbench` package.

What does happen if you train your perceptron on the `XOR` example?

Exercise 3:

Show the derivative of the cross entropy error function (slide 25) with respect to the activation z_k for an output unit having a logistic sigmoid activation function satisfies

$$\frac{\partial L}{\partial z_k} = y_k - f(x)_k.$$