Neural Networks and Deep Learning

Cracow University of Technology

Lab Assignment 4:

Task: Implementation of backpropagation in neural networks with one hidden layer and using three different optimization methods: SGD, minibatch SGD, and GD.

In this lab we are going to implement a neural network with one hidden layer. The architecture of our neural network is as follows:

- Input layer
- One hidden layer
- Output layer (one-hot encoding)
- Sigmoid activation function for the hidden layer and Softmax for the output layer.

We have a dataset of different types of iris flower. This is a famous dataset containing 3 classes of 50 instances each. You are asked to write a neural network code to classify a sample in the correct class. So we have a classification task. This is the link to the dataset:

https://archive.ics.uci.edu/ml/datasets/iris

- Please implement backpropagation using the concepts we saw earlier.
- Try different training techniques: online, minibatch, and batch gradient descent.