Artificial Intelligence Methods

Assignment 7

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1 Exercise 1 - Feedforward Neural Network

I have implemented an ANN that takes two inputs, has two hidden units using sigmoid activation and one output unit with linear activation. I then tried to use X train and y train to train the neural network, however my code does not work properly and I did not figure out why before the deadline. Still, I calculated the Mean Squared Error (MSE) for both the training data set and the test data set. Underneath follows a screenshot from the terminal where the MSE for both data sets is shown:

```
sindrethronaes@Sindres-MacBook-Pro-2 Oving7 % python3.9 assignment_7.py
MSE for Training Set is: [0.70705977]
MSE for Testing Set is: [0.7118411]
```

For this assignment some hyperparameters where fixed while others were left up to myself to figure out. The topology of the network was fixed as a three-layer model consisting of two input nodes, two hidden nodes and one output node. The activation functions were also described in the problem description, however the actual sigmoid function implementation can vary as there are several functions that can be classififed as sigmoid function. I used the logistic sigmoid function for the hidden layers, and for the output layer I used the unit-step function as a linear activation function. As for the learning rate, I used n = 0.0025 as done in the lecture, but since I didn´t get to train my network because of an error with my code I'm not too sure how this would have effected my algorithm.