

THE2

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I. INTRODUCTION

This report includes the discussions about CENG499 Machine Learning THE2 Homework

II. DISCUSSION

A. Feature Scaling Technique

Min-Max scaling technique is used for scaling each features to 0-1 range. Using min-max scaling, all different range features are scaled to the same range. Luckily there was no feature that has the same max and min so min-max scaling were used.

B. Effects of the Different Architectures

I tried 5 different architectures:

- No Hidden Layers
- 1 Hidden Layer with 1 Neuron
- 1 Hidden Layer with 3 Neurons
- 2 Hidden Layer with 3 Neurons
- 3 Hidden Layer with 3 Neurons

Their plots can be found on the Plots section.

For all architectures, error of set2 was dropping more rapidly at first but then set1 is converging quick. I think that's related to structure of the data.

Adding more layers resulting in sudden drops at some points and overall covering time got shorter.

C. When to Stop Updates

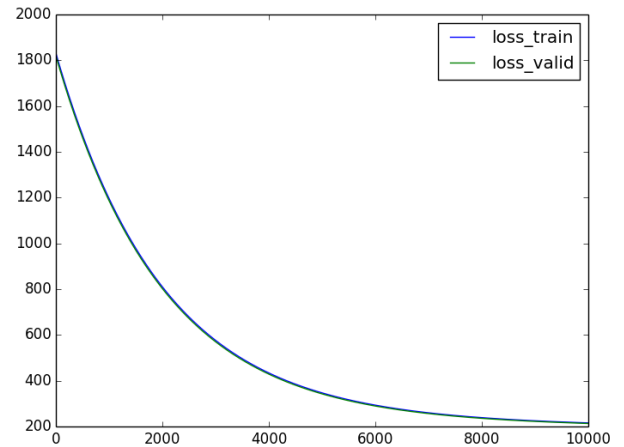
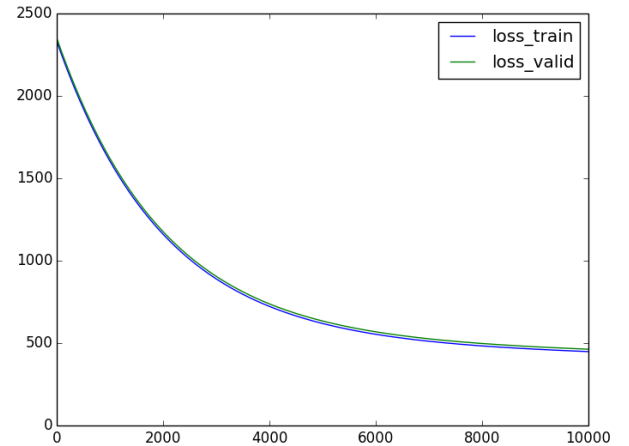
As it can be seen in the previous subsection, all lines are converging after some amount of epochs. We can stop updated there.

D. Training and Validation Sets

80% of training set is used for training the models and 20% is used for validation.

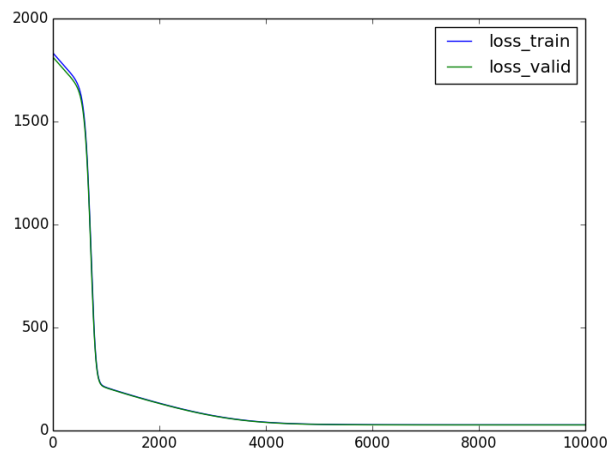
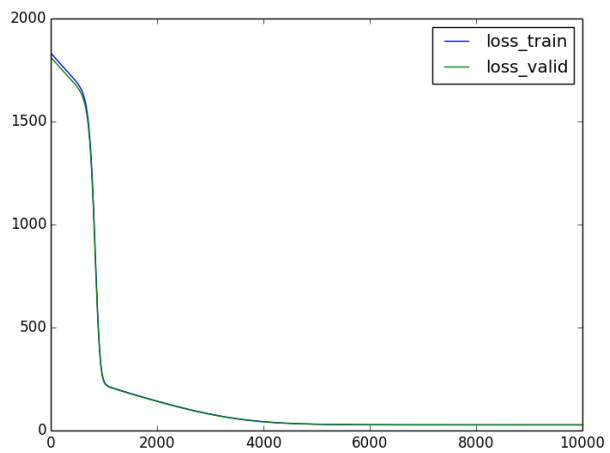
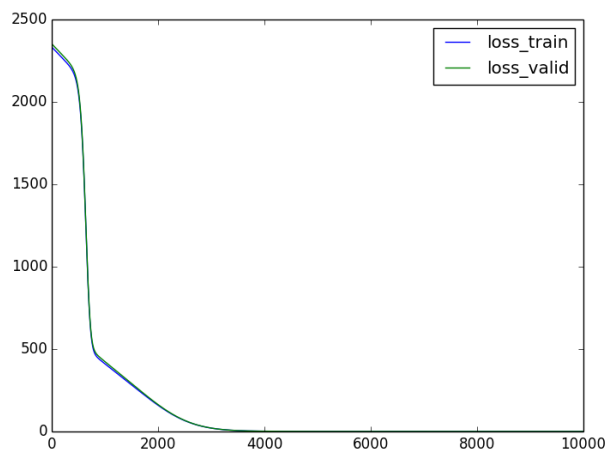
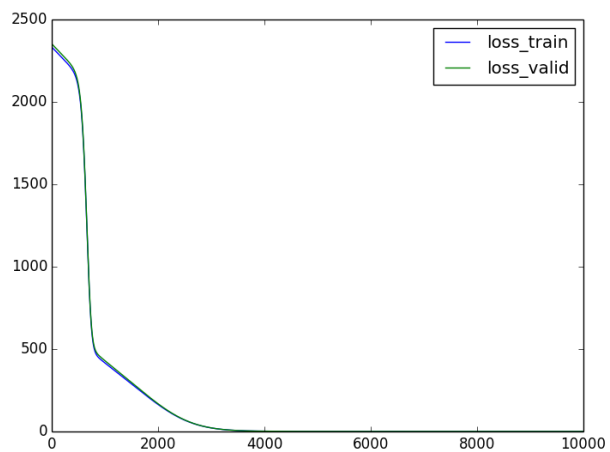
III. PLOTS

A. No Hidden Layers: Set1 and Set2

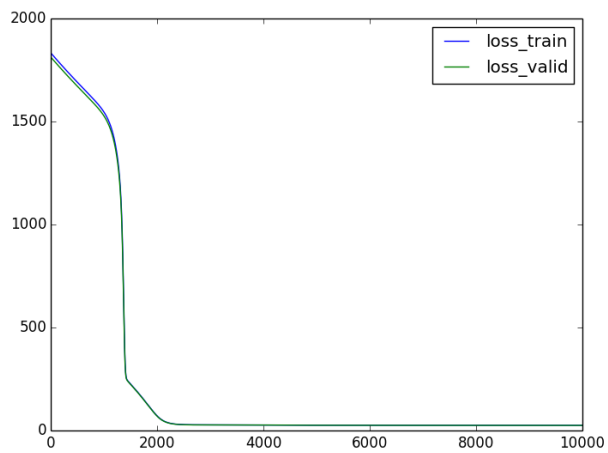
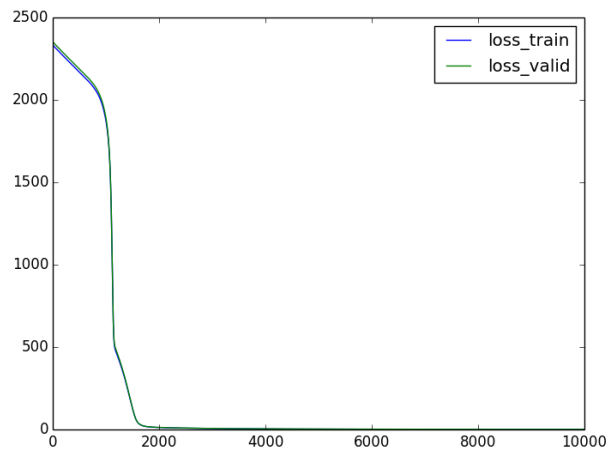


B. 1 Hidden Layer with 1 Neuron: Set1 and Set2

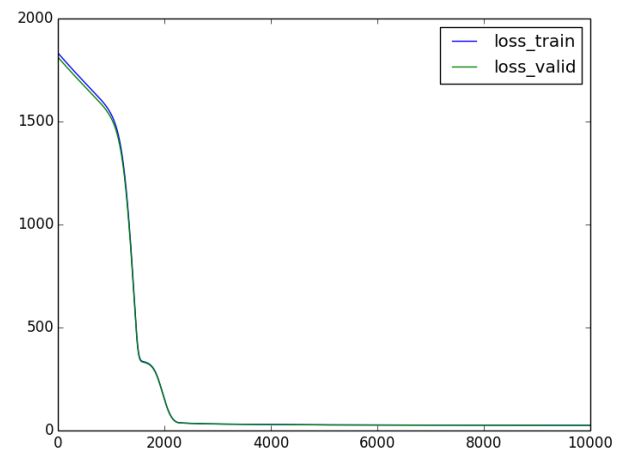
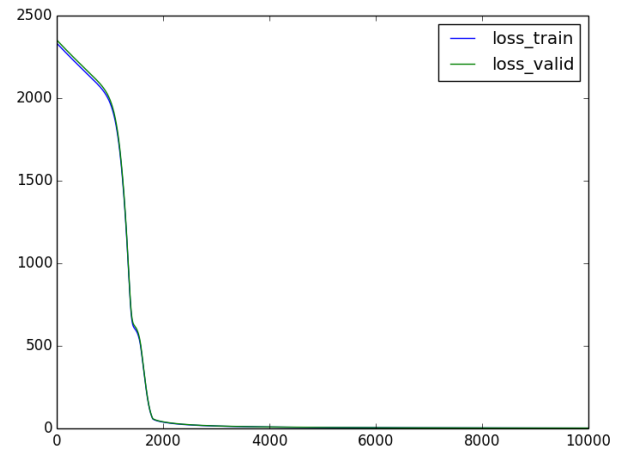
C. 1 Hidden Layer with 3 Neurons: Set1 and Set2



D. 2 Hidden Layer with 3 Neurons: Set1 and Set2



E. 3 Hidden Layer with 3 Neurons: Set1 and Set2



IV. CONCLUSION

Using artificial neural networks for regression and analyzing error history is very cool idea.