University of Oslo

FYS-STK4155

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Something catchy

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Abstract

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1 Introduction

Introduction to project (what is the goal?). Brief introduction to logistic regression and neural networks. Why is it beneficial to study both? Introduce paper that we want to compare our results to.

Write briefly about the chosen data set; features, binary targets, number of observations etc. More on how the data is preprocessed in the method section.

Structure of report.

2 Method

2.1 Logistic regression

2.1.1 Cost function

Cost function: minimise cost

2.1.2 Gradient descent

Stochastich gradient descent with mini-batches. What is gradient descent? Why do we need mini-batches? Difference between SGD (stochastic gradient descent) and BGD (batch gradient descent?).

By using mini-batches, the gradient is computed against more training samples (mini-batches). When the data set is large, this may perform better than stochastic gradient descent. This allows us to get a better understanding of the gradient descent before every gradient is computed. This makes the algorithm more efficient, which is preferrable when dealing with large data sets. The gradient computed at each step is then averaged over additional training samples, which may result is smoother convergence. **FIND A GOOD REFERENCE TO THIS.**

2.1.3 Activation function

Sigmoid function

2.2 Neural network

Feed-forward neural network. Make figure/cartoon? Reusable functions from logistic regression.

2.2.1 Backpropagation

2.3 Data preprocessing

2.4 Code

Write about the setup of the code, include pseudo code if necessary. What does the design matrix look like? How is β found numerically?

3 Results

4 Discussion

5 Conclusion

6 Appendix

Relevant programs developed to solve this project can be found at the GitHub address

`https://github.com/hellmb/FYS-STK4155/tree/master/Project_2`

References