Title: Neural Networks

Presentation link: <https://drive.google.com/file/d/1ERUgKjJK2l7IoBM3Yb4YeicuI3tXx3jd/view?usp=sharing>

Github Repository:

<https://github.com/Kyle-DM523/info523-final-project-NN>

Presenters: Kyle Arechiga

John Siahaan

For our final project, we made a neural network to predict mortality risk of heart disease patients. Neural networks use is virtually limitless in our daily life because they are made to mimic how our brain functions when presented with daily problems. One such problem in the health industry is predicting mortality risk of heart disease patients in hope of prescribing medications and recommendations to lower their mortality risk.

For our dataset, we used data from a Pakistani hospital due to its immediate availability on kaggle.com. We performed some data mining preprocessing to clean up the data and transform into numerical values for the model to learn. There can be many possible combinations of hidden layers and number of neurons for our model. With 56 input neurons, we discover that a single hidden layer between 20 and 30 neurons give us the highest accuracy of prediction. Our model uses 2 hidden layers of 3 and 2 neurons with accuracy of 94.55%. Our analysis shows that in general best fit is to have higher number of neurons in the first hidden layer than the second hidden layer.

For future work, we can perform neuron pruning by removing insignificant neurons that are close to zero weight. Having more data is always good for any neural networks. This work only scratches the surface of neural networks capabilities that will certainly lead to deep learning. It was a great exercise in data mining as we stepped through every phase of it. It reinforces the material learned on data mining.