Define Numbers

It is just relative

1. Clump Thickness: Higher number = more chance of cancer
2. Uniformity of Cell Size: Lower number = more chance of cancer
3. Uniformity of Cell Shape: Lower number = more chance of cancer
4. Marginal Adhesion: Lower number = more chance of cancer
5. Single epithelial Cell Size: Higher number = more chance of cancer
6. Bare Nuclei: Higher number = more chance of cancer (index, actual count of bare nuclei in the group of cells)
7. Bland Chromatin: Higher number = more chance of cancer
8. Normal Nucleoli: Smaller number = more chance of cancer
9. Mitoses: Higher number = more chance of cancer

Malignancy Test (Section 1)

Ten unique neural networks with different sets of weights yet trained on the same data set are created for the malignancy test. The input data entered by the user of the application is then tested on all ten networks. A step wise function is implemented at a five percent chance of malignancy for all the networks. Nine of the ten networks need to agree on their conclusion in order to say with any degree of certainty that the input data represents a benign or malignant state.

Abstract (Section 2)

The challenge of diagnosing any type of cancer is that the no single test can accurately succeed. Diagnostic testing is essential to successfully evaluate the health of an individual and determine whether or not the symptoms are caused by cancer or another disease. Diagnostic imaging is a useful technique to produce an internal picture of the body in order to analyze its structure. However, it is still up to the medical professional to successful analyze the images and determine whether the individual has cancer. While analyzing the data taken from the imaging with neural networks, the analysis can be made more efficient, but also one can minimize the error that occurs during diagnostic testing.

The purpose of the project is to implement a successful neural network with back propagation to analyze a breast cancer numerical dataset. It also evaluates the efficiency or the network as it is influenced by different conditions. The efficiency is gauged by the error percentages accumulated by the network. Furthermore, statistical analysis is applied to the network in order to analyze the effectiveness of the neural network.

Conclusion (Section 4)

The total error calculated for the network is 3.2%. Despite the imprecision of the network, an algorithmic model would be near impossible to create, thus the network allows for an efficient solution. However, it is not only applicable to breast cancer but to any dataset can’t be modeled by conventional methods. The project also creates an application to utilize the network to accurately diagnose cases of potential breast cancer.