MsBD 6000b assignment 1

Introduction
SVM and Neural Network are used for this assignment to predict the result. SVM is a baseline classifier for evaluate the performance of Neural Network.

Model
The hierarchy of the NN is constructed by 3 hidden layers with 256, 128 and 64 units respectively. Output layer is a single perceptron for binary classification. For all hidden layers, Relu is used as activation function and sigmoid is used for output layer.

About the SVM classifier, polynomial kernel is chosen with hyper parameter gamma 0.1, degree 4, C 1 as smooth factor and coefficient 10. The accuracy of SVM with 5 folds validation is around 94%.

Data Preprocessing
In order to speed up the training time and improve the performance. All training and test data are normalized to value between 0 and 1.

Implementation
Tensorflow and Keras are choosen for the framework for building multi-layer neural network. Each of the layer are fully connected. Binarey cross-entropy are used for calculating loss. For the whole training process, the batch size is 10 and running for 100 epochs.

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	Accuracy
SVM ploy(gamma=0.1, degree=4,coeff=10, C=1	~94%
Multi Layer Neural Network Classifier	~98%

Instruction to run the project.

1) Run 6000b_a1.py, it is SVM baseline. Then result will be generated to result.csv
2) Run 6000b_a1_nn.py, it is MLP classifier. Then result will be generated to result_nn.csv.