	Ideal Score	Shen Yang Team: YS Score	Instructor Notes
Total Points	10	9.4	Score Points:09.40
Total Percentage	100	94	
Exceptional work: **(Required for 7000 Level**)Capture the embedding weights from the deep network and perform t-SNE clustering on the output of these embedding layers. That is, pass the observations into the network, save the embedded weights (called embeddings), and then perform clustering of these output embeddings. Visualize and explain the results.	10	10	Great analysis of the embeddings.
Define and prepare your class variables. Use proper variable representations (int, float, one-hot, etc.). Use pre-processing methods (as needed) for dimensionality reduction, scaling, etc. Remove variables that are not needed/useful for the analysis. **Describe the final dataset that is used for classification/regression** (include a description of any newly formed variables you created).	10	10	
Identify groups of features in your data that should be combined into cross-product features. Provide justification for why these features should be crossed (or why some features should not be crossed).	10	8	This was good, but correlation is not exactly what I was looking for in this. The argument is better made by discussing why memorizing two categircal values might be beneficial for the business case.
Choose and explain what metric(s) you will use to evaluate your algorithm's performance. **You should give a detailed argument for why this (these) metric(s) are appropriate on your data**. That is, why is the metric appropriate for the task (e.g., in terms of the business case for the task). Please note: rarely is accuracy the best evaluation metric to use. Think deeply about an appropriate measure of performance.	10	10	You have a reaosnable argument, but I also think you are worried about false positives. Keeping a house on the market for too long also costs money because the seller is contuniung to pay rent. And this rent only prvides equity to the depreciating house value.
Choose the method you will use for dividing your data into training and testing (i.e., are you using Stratified 10-fold cross validation? Shuffle splits? Why?). Explain why your chosen method is appropriate or use more than one method as appropriate. **Convince me that your cross validation method is a realistic mirroring of how an algorithm would be used in practice.**	10	10	Good. You could also use a McNemar test here so that you do not need to have 5 folds for model comparisons. Its still relevant for your data and provides a nice statistical comparison with limited points.
Create several combined wide and deep networks to classify your data using Keras. Visualize the performance of the network on the training data and validation data in the same plot versus the training iterations. Try to use the "history" return parameter that is part of Keras "fit" function.	20	20	Most models did converge, though the final model could probably have been run for longer.
Investigate generalization performance by altering the number of layers in the deep branch of the network. Try at least two different number of layers. Use the method of cross validation and evaluation metric that you argued for at the beginning of the lab.	20	19	This was nearly perfect. To improve: talk a bit about how the model will generalize and perform in your business case. Is the 82% accuracy good enough for the model to be deployed?
Compare the performance of your best wide and deep network to a standard multi-layer perceptron (MLP) using the receiver operating characteristic and area under the curve. Use proper statistical method to compare the performance of different models.	10	7	You are rounding the values of yhat before placing them in the ROC, which is a conceptual error regarding the process of the ROC. You need to look at the ROC given a range of probabilties, not the binarized versions.