Assignment 4 Questions – SEAS 6401

1) What sector are you currently working in, and how does the "last-mile" integration process come up in your sector?

I used to work in the banking industry in China. A common last-mile issue in commercial bank is that the volume of customers is huge every day. Most of them are not familiar with the process or do not understand the reason of the regulations, for example, some business requires ID to verify the customer identity to ensure the account security, some customers feel it is not need especially after they have waited for long time in the queue.

2) How have you seen the last-mile problem solved in your industry? If you are not currently working, pick the industry you hope to work in and provide an example of what a "last-mile" solution may look like.

The solution to the issue mentioned in question (1):

Designate a staff to do the pre-screening for all customers entering the bank hall, asking the business and check if they have prepared sufficient documents.

3) What was the impact of pruning on model performance? What level of pruning resulted in optimal model performance, and why do you think this was the case?

Pruning will prevent overfitting and gain the generalization ability of a model.

The pruning should be chosen based on cross validation or a validation set so that it can prevent overfitting, but it also does not underfit the data.

4) What was your overall experience like working with the multi task artificial neural networks or MANN package?

- https://github.com/AISquaredInc/mann (MANN repo)
- https://dbc-bec0383a-229c.cloud.databricks.com/?o=1178442625600698#notebook/4467162434126975/command/1264848823538547 (MANN notebook in Databricks)

The package has a seamless integration with TensorFlow. It has the same grammar and layout of outputs as TF. My understanding is the MANN package created some innovative layers based on tf.Keras layers. The pruning is the threshold value which forces gradients less than this value to be 0.

5) How did you find the documentation on Github? Was there anything you weren't clear about that was not covered, or should have been covered more thoroughly?

README.md on the mann repo and the mann-notebooks repo. It may be helpful for the document to include a starter code. It can also give some background on the multi-tasking learning and pruning.

6) Would you consider using AI Integration and Augmentation technology (e.g. AI Squared) outside of this workshop setting?  Why or why not?

It depends on the level of customization the project needs and power that the integration/augmentation provide.

7) What are 3 examples of why you would use a multitask model (e.g. a model that includes NLP, computer vision, and regression all together) in either your research or in your current work role?

1. generate image based on text/voice input (e.g., gaugan)

2. web search using voice input

3. web search using image input

8) What are 3 examples of why you would use an optimized (e.g. model that has been pruned or quantized) in either your research or in your current work role?

1. Use autoencoding to reduce the cardinality of categorical variables.

2. Feature selection to reduce features.

3. Decision tree pruning.