Rex Partner Report

Dear Rex,

It has been our pleasure collaborating with you on this project. This email is to give an overview of our work. Additionally, we have also attached our updated technical report which gives a more detailed breakdown.

As mentioned in previous meetings, we intend to focus on predicting demand for homes listed in the Denver area. The attached technical document outlines our approach to predicting demand and the next steps we are taking to overcome our challenges.

Current Stage:
Over the past few weeks, we have updated both non-submarket and sub-market baseline models with the new dataset, as well as implementing new metrics for comparison. The metrics are centered on aggregated sub-market level predictions instead of the granularity of individual homes. Moreover, we have performed cross-validation on the number of submarkets in a bid to identify the optimal number for maximal performance.

For the developed models, the EM approach was successfully trained on the new dataset with 2 different hedonic functions, namely logistic regression and XGBoost. The model was deployed on AWS for more efficient parallelization as well. Preliminary results indicate superior performance using XGBoost but more analysis will be done to determine the efficacy of the developed model compared to baselines. It is also noteworthy that estimation via the PyMC3 approach fails on the new dataset even with K-means initialization, plausibly due to high dimensions and inordinate amount of computational time and memory required for convergence.

Future Plan:
The stage we are at is promising as the final milestone approaches. Our next steps ahead of that point include the following:

- Understanding the generalizability of the model - how long do the submarket classification maintain similar results?
- Visualising our submarket results and diving further into interpretability
- Attempting to tackle the difficulties with PyMC3 to compare with the EM approach

Please let us know if you have any suggestions or concerns regarding our project, and we look forward to our next chat on Zoom!