**Stat 602 Class Project Weekly Updates**

**Competition: NYC Real Estate Price Competition**

**Team Kaggle Name (if Relevant): k fold k times**

**Team Members:** Reid Vincent Paris (Vinny),Subrata Pal, Amin Shirazi

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**Week 12 (April 12-16) Summary of Activity and Progress:**

**Amin:**

We spent most of our time on understanding the data, cleaning the data, and dealing with NA’s in the data to come up with tidy data. One major problem was the abundance of zeros in the data for ‘residential units’, ‘commercial units’, ‘land square feet’, and ‘gross square feet’. Instead of removing them from the data, I tried some naïve imputation approaches. I tried to replace the zeros with the median of the variables in the same area. i.e., I first filtered on the properties in the neighborhood in which there are non-zero values for the four variables I mentioned, and then tried to take their medians to come up with some values for the zeros. I am not sure if that is the best approach, but this might be helpful. I also worked on the NA’s for factors in the data such as tax class and building class. We ran a multiple linear regression on the raw data first (where we put aside all rows with NA) and then on the data after replacing the zeros and NA’s.

**Vinny:**

I focused mostly on data exploration, especially in reference to the residential/commercial/total units and year built. For the year built there appears to be a cut off year where the variance past it (1959 ish) becomes much more stable. As for residential units it turns out that log(res\_units + 1) actually seems useful although co-ops muddle the water since it appears that routine apartment/condo/townhouse sales can/will be posted with the co-op statistics (eg 800 units in total). A cheat around this is to fit two models to residential units (one before a certain number of units and one after, found minimizing SEL (for log(price + 1)). For both residential units and year built a binary variable was created to mark the change in the model and to prep for interaction terms in our model. Total and commercial units seem to have little to no effect. Also, I grabbed inflation data for Queens County NY single family housing from the Federal Reserve Bank (#EndTheFed #RonPaul) although I’m uncertain if it will be worth estimating/using for moving only one year into the future.

**Subrata:**

First, we started Exploratory Data Analysis of the data and looked for anomalies or other problems in the data format or data values. Histograms of some covariates(areas in square feet) were highly skewed, and transformations (such as log-transformation) gave them more uniformity or ‘Gaussianity.’ Sometimes it can be seen that the same building was sold many times in a short interval, or there are buildings in a very close neighborhood. Vinny inferred that those would be the co-ops with high sq feet area. There were minor differences in input data format for some of the covariates, like the building class, which were taken care of. Other minor works include the change of date formats. We also studied a Multi-Dimensional-Scaling of the numerical training data covariates with color related to the price to look at possible cluster formation.

**Week 13 (April 19-April 23) Summary of Activity and Progress**

**Week 14 (April 26-30) Summary of Activity and Progress**

**Week 15 (May 3-May 7) (Finals Week) Summary of Activity and Progress**