

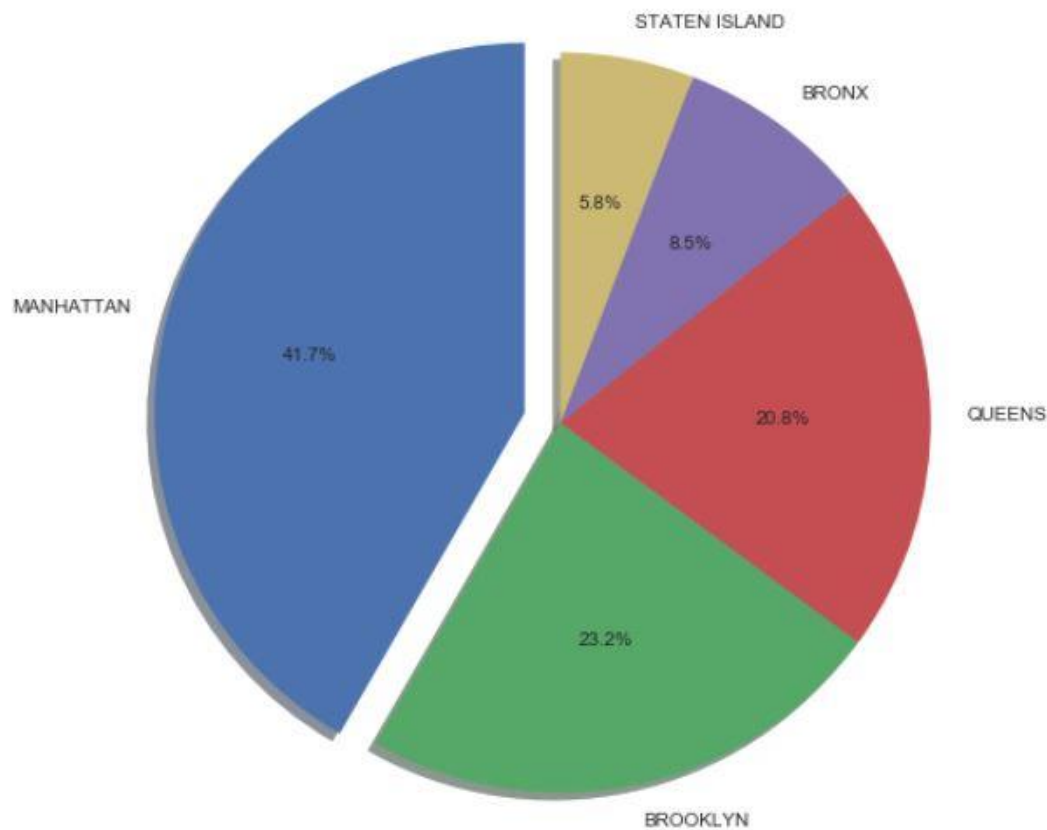
Topos Inc. Data Science Challenge

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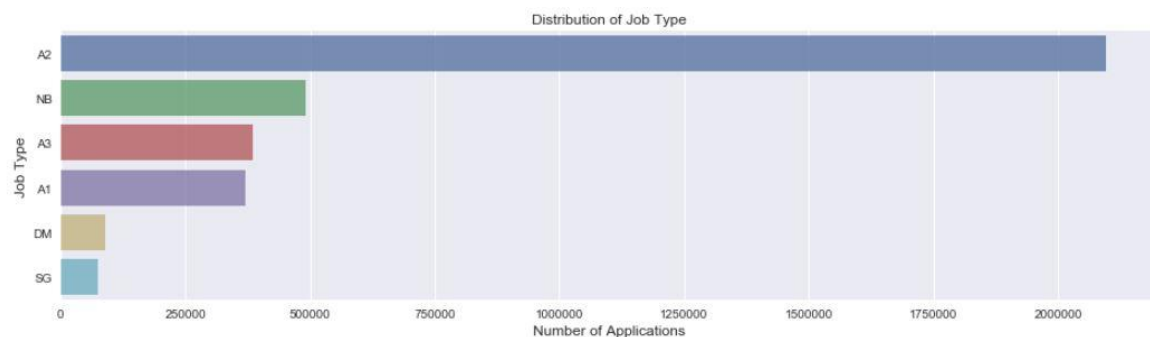
The data set given in hand was the NYC DOB Permit Issuance data available on Open data. The data contains around 3.5 million observations for 60 features. For the analysis, Jupyter Notebook using Python was used. The EDA is as follows:

The distribution of Permits is analysed in 3 ways i.e Borough-wise, Job Type-wise and Work Type-wise.



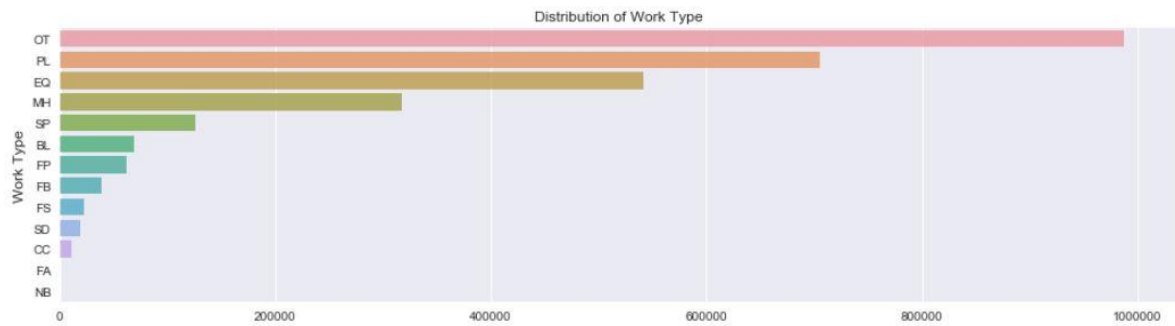
From the plot, it is evident that majority of permits filed are for Manhattan followed by Brooklyn and Queens.

The distribution of Job Type is shown in the below image.

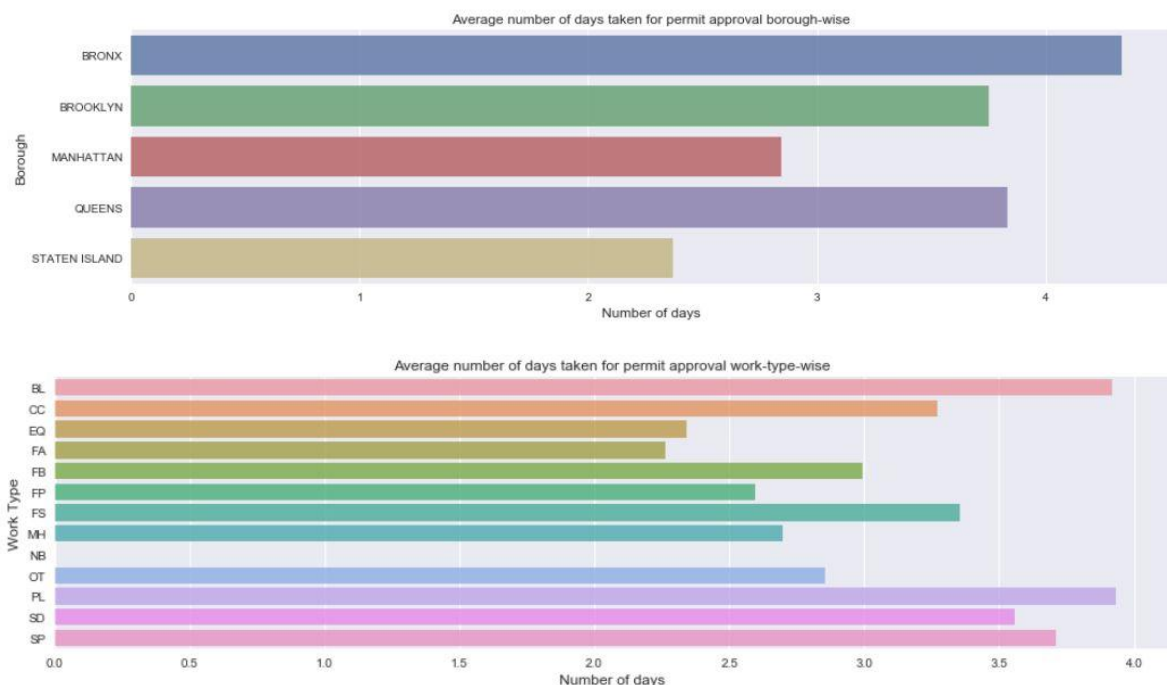


The majority of permits filed are for Job Type – A2 (Alterations 2) followed by NB (New Building).

Each of these Job Types have sub-categories known as Work Type. The distribution of Work Type is shown below.

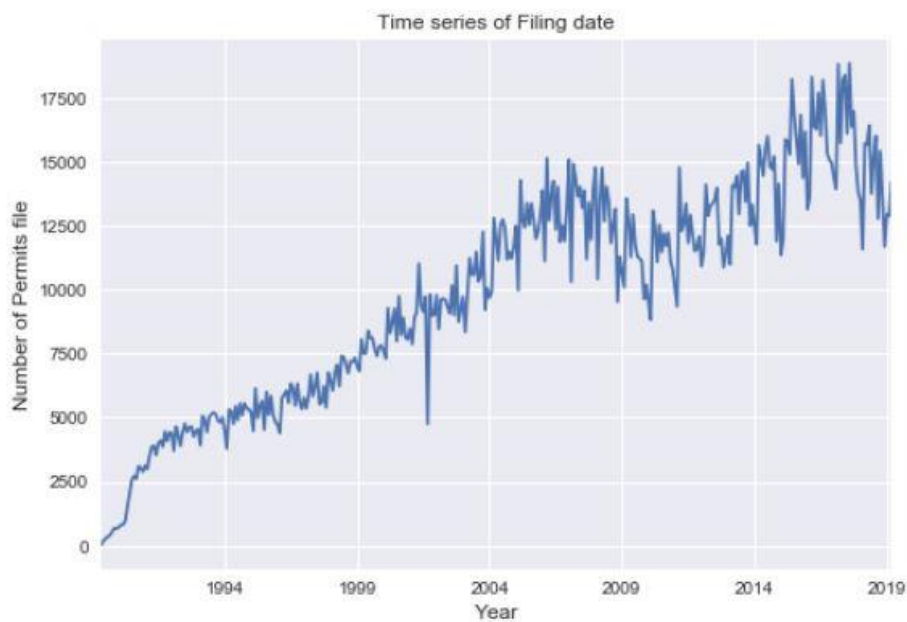


The second part of the analysis was to find out how many days are taken to get an approval for the permit filed. This analysis was done both borough-wise as well as work type wise. The results are shown below.

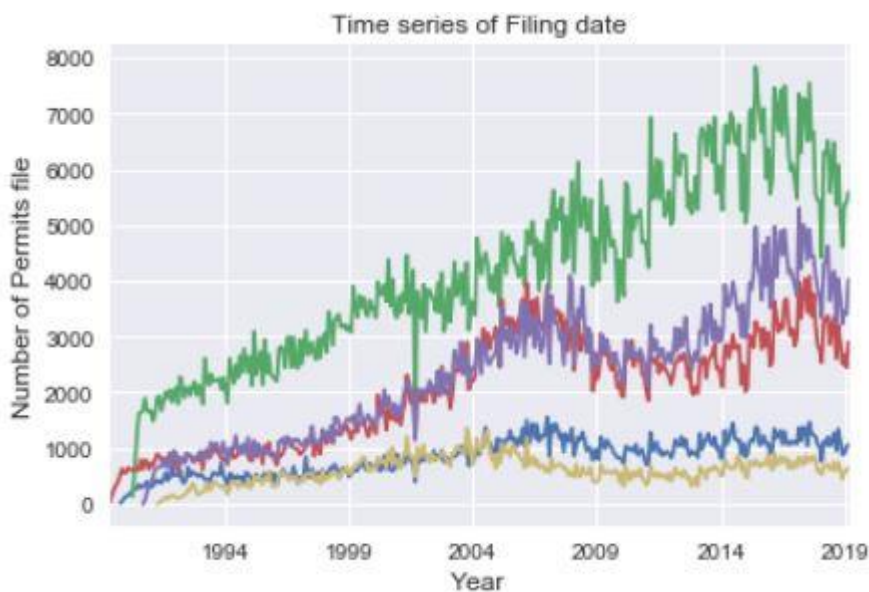


From the above plots, it is evident that the permits for Staten Island are approved quickly and the permits for Bronx takes the longest among the 5 boroughs. Also, the permits for work type EQ and FA are issued quickly than permits for other work types.

The Time Series plot for permits filed is shown in the below image.

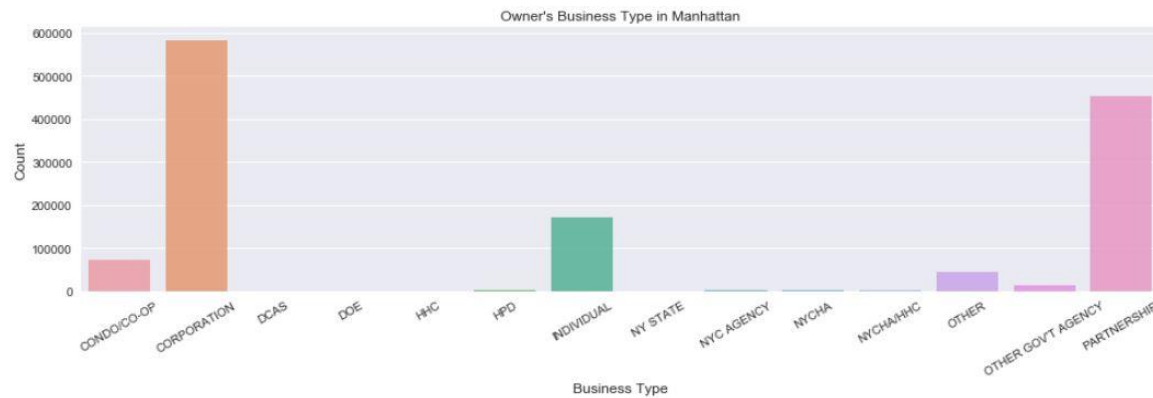


It is pretty intuitive that the number of permits filed increased within the recent years. The time series plot for each borough is shown in the below image.

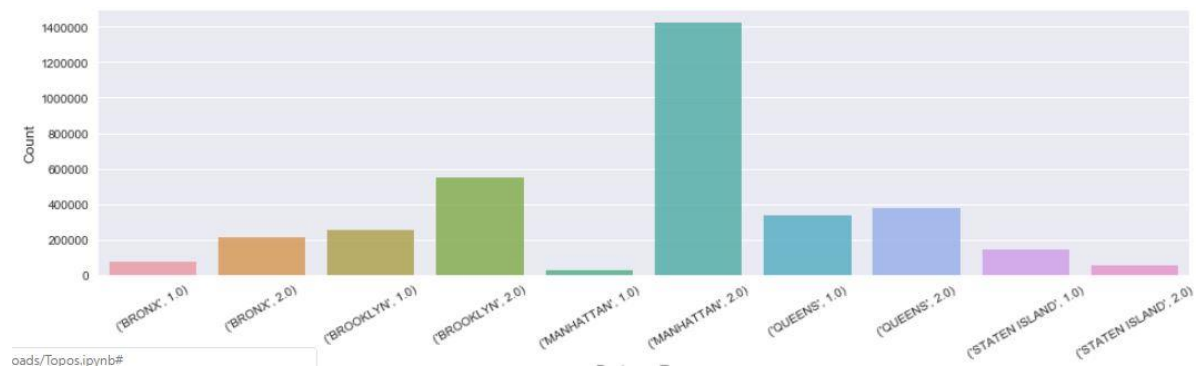


It can be noted from the plot above that Manhattan, Brooklyn and Queens are following the trend shown in the time series above but Bronx and Staten Island do not. The number of permits filed for Bronx and Staten Island have not increased but remained comparatively same.

Narrowing the analysis to Manhattan with most number of permits filed, below plot shows owner's business type for Manhattan.



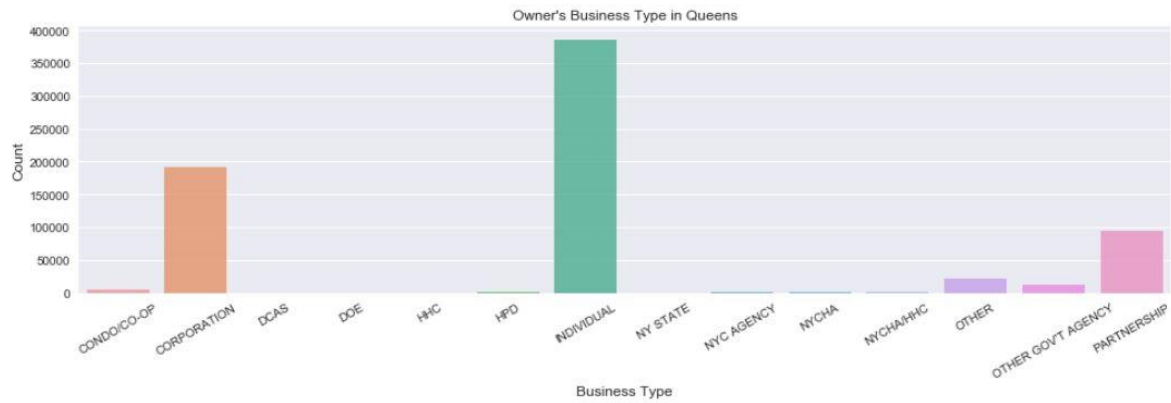
It can be noted the majority of permits filed are from Corporation and Partnership business types. This must be because Manhattan has more commercial buildings compared to residential buildings. The below plot supports are claim.



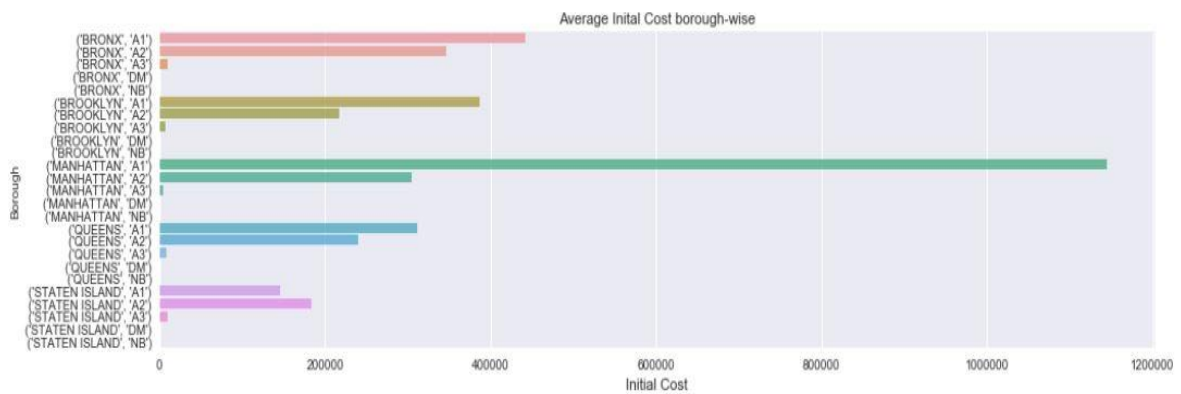
The above plot supports are claim that Manhattan has majority of commercial buildings compared to residential buildings. It can also be noted that Queens and Brooklyn have highest amount of residential buildings among the 5 boroughs.

As Queens and Brooklyn have more number of residential buildings, the ownership in these boroughs should be more of individual compared to corporations and partnerships. The below plot of ownership type for Brooklyn and Queens support our claim.





The DOB Permit Issuance data was merged with DOB Applications filing data on the Job # and the average Initial cost for job type borough wise was calculated. The below plot shows the results.



It can be stated that the Initial Cost of a project is highest for Alterations Type 1 in Manhattan.

Summary:

1. Manhattan has maximum number of permits filed.
2. Most permits are for Alteration 2.
3. The trend of permit filing for over the years has increased for Manhattan, Brooklyn and Queens while it is constant for Staten Island and Bronx.
4. Manhattan has most business type Corporation and Partnership while Brooklyn and Queens have Individual.
5. Residential buildings are build/renovated more in Brooklyn and Queens compared to other boroughs.
6. Average Initial Cost for Alterations Type 1 in Manhattan is highest.