# Building Permit Analysis

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# Overview:

- Identification and prediction of NYC building permit trends.
- Classification of pre-1940 buildings based on recent maintenance.
- Providing insights for investment firm stakeholders.

# Stakeholder: MetroStar Real Estate Investment Firm

- NYC-based investment firm focusing on new developments and renovations.
- Effective shaping of investment strategies through data analysis.
- Prediction of city construction trends for investment potential.

# Data Understanding:

- Utilization of DOB NOW: Build – Approved Permits and PLUTO datasets.
- Comprehensive information on building permits and extensive land use details.
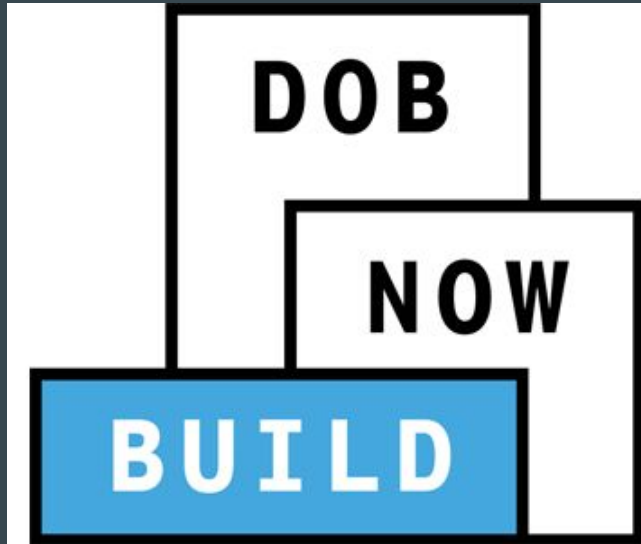
# Old Buildings Classification & Maintenance

- Categorization of pre-1940 NYC buildings based on post-2018 maintenance.
- Identifying renovation and value enhancement opportunities.
- 100% Accurate*
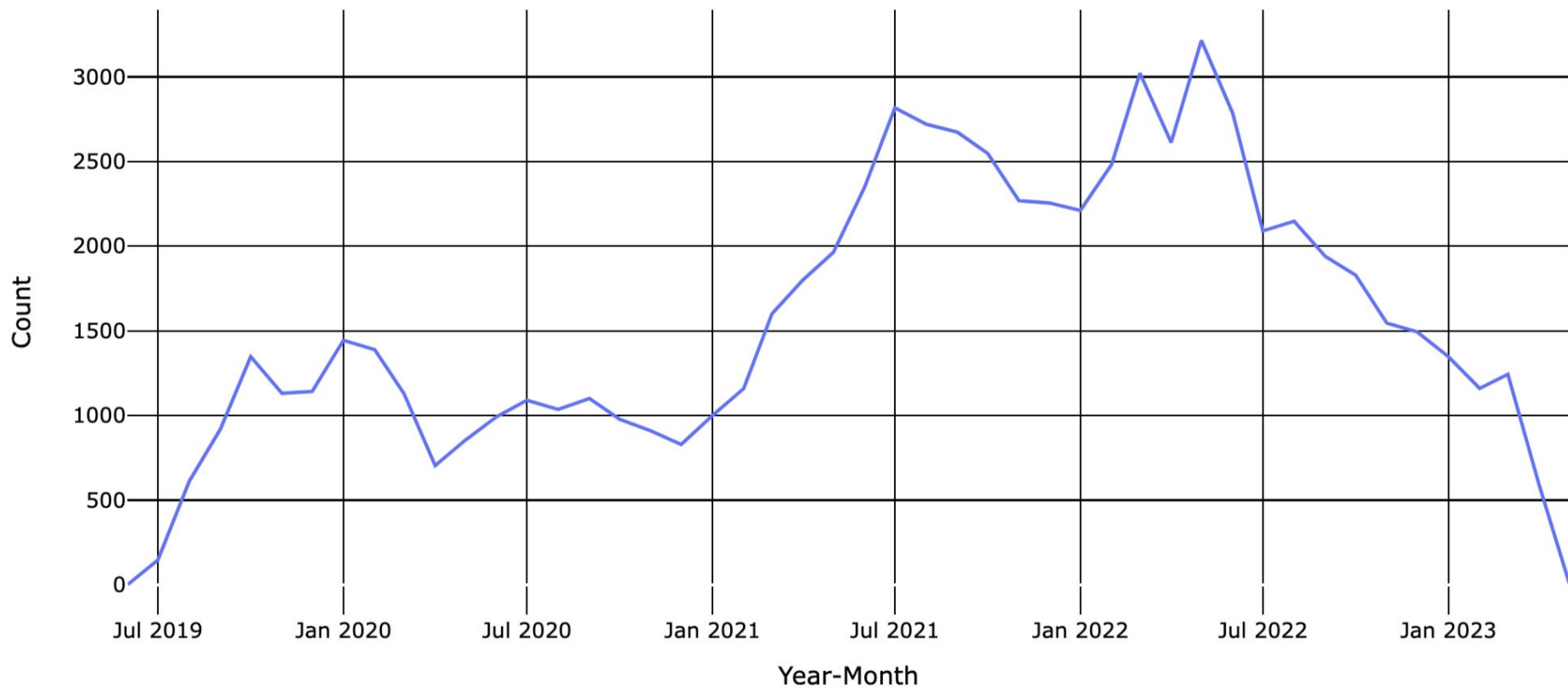


Confusion Matrix for XGBoost
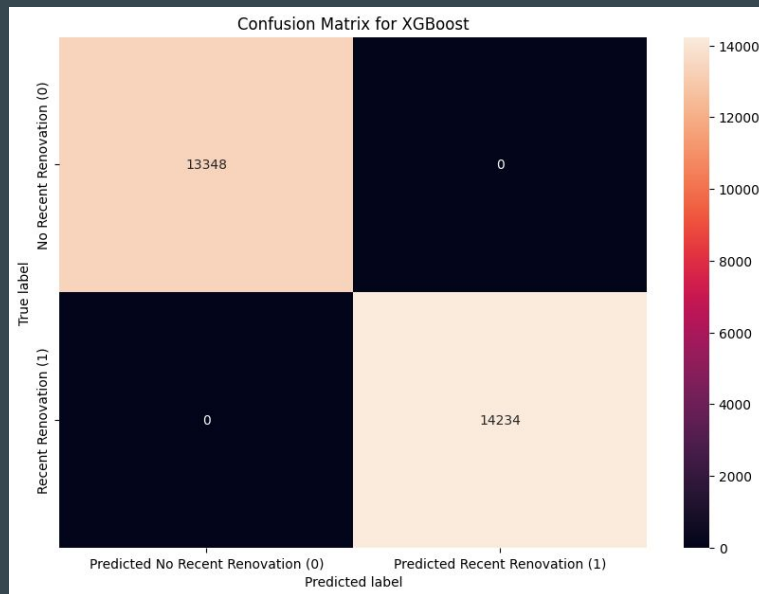
# Classification Model Insights:

- 'Approved Year' feature critical to model due to strong connection with recent renovation activity.
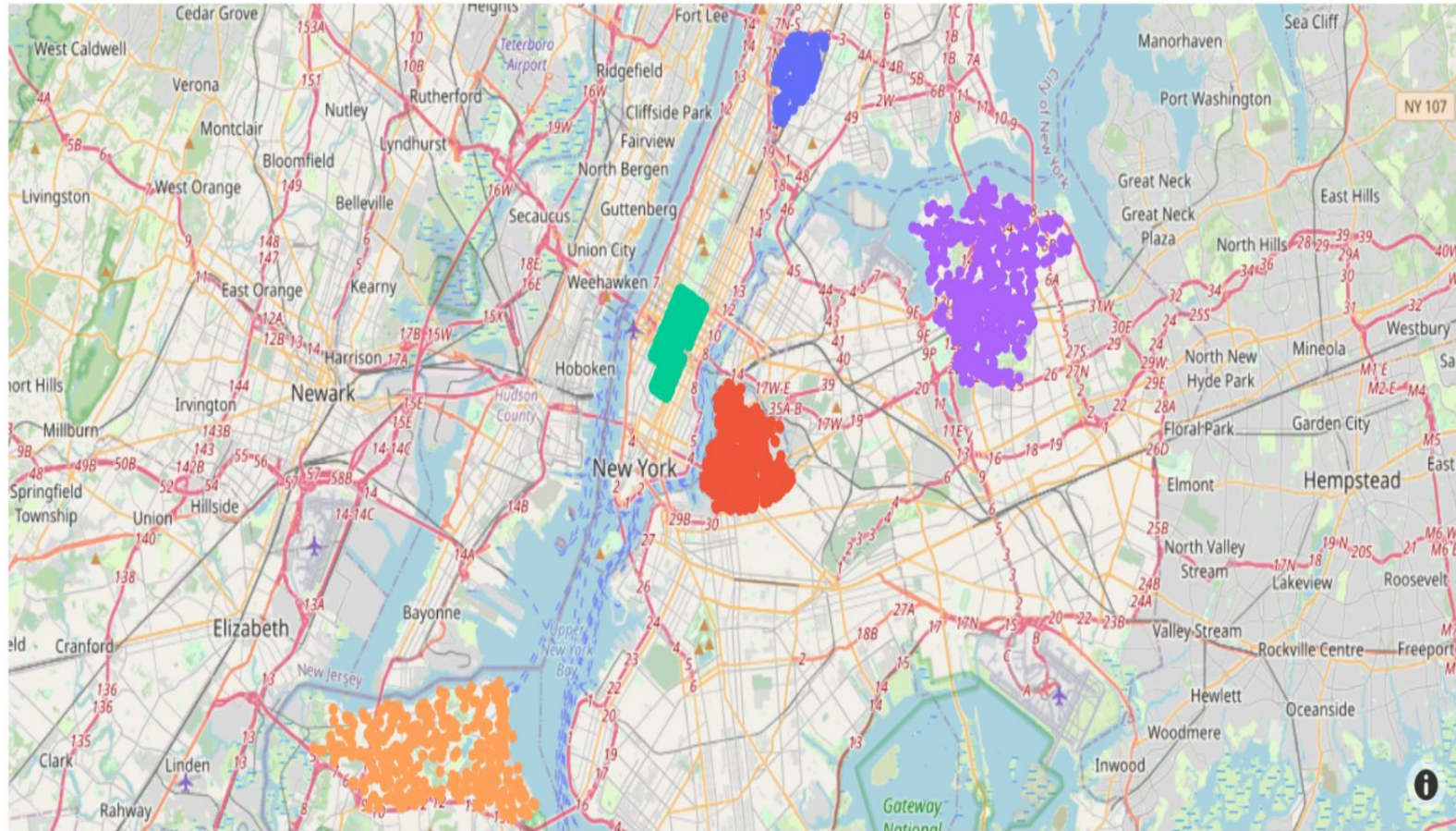- Potential data leakage due to tight correlation between 'Approved Year' and target variable 'recent_permit'.

Permits Approveed by Borough
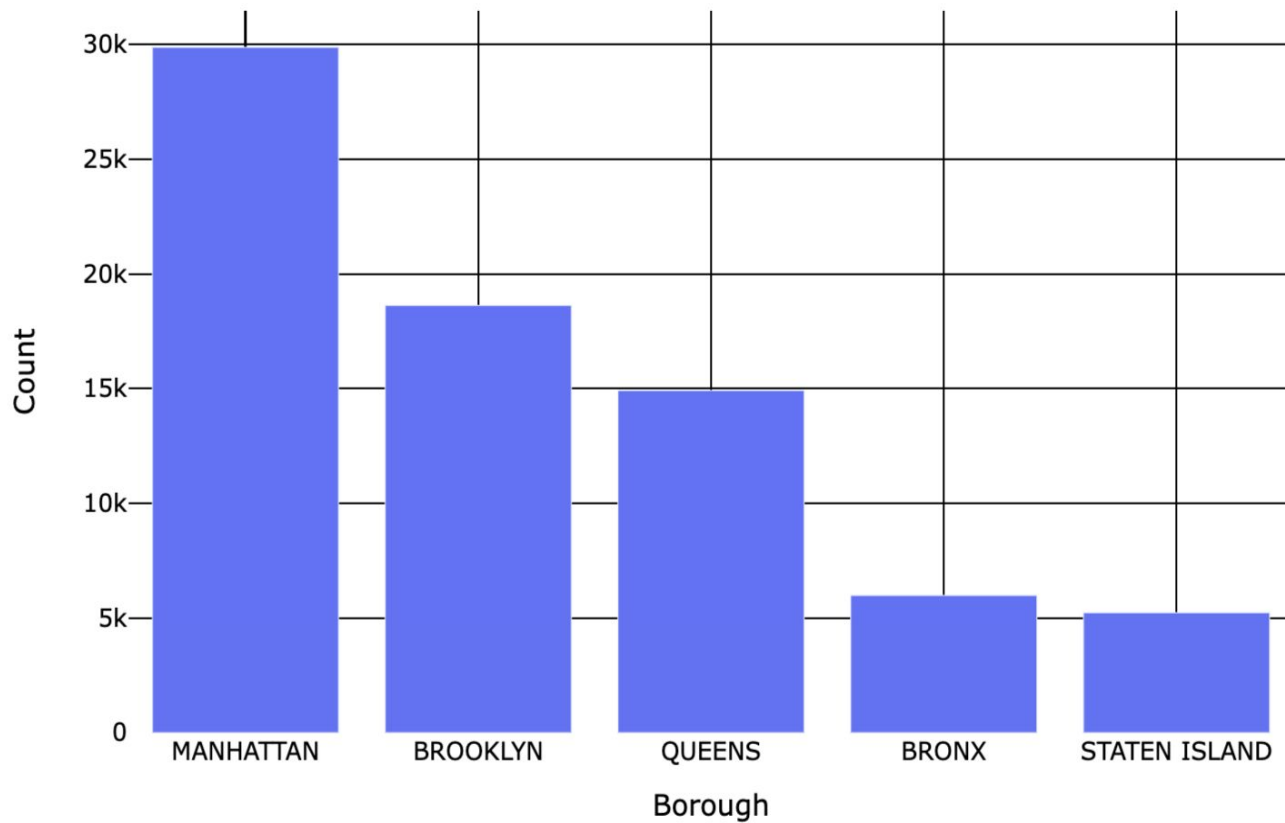
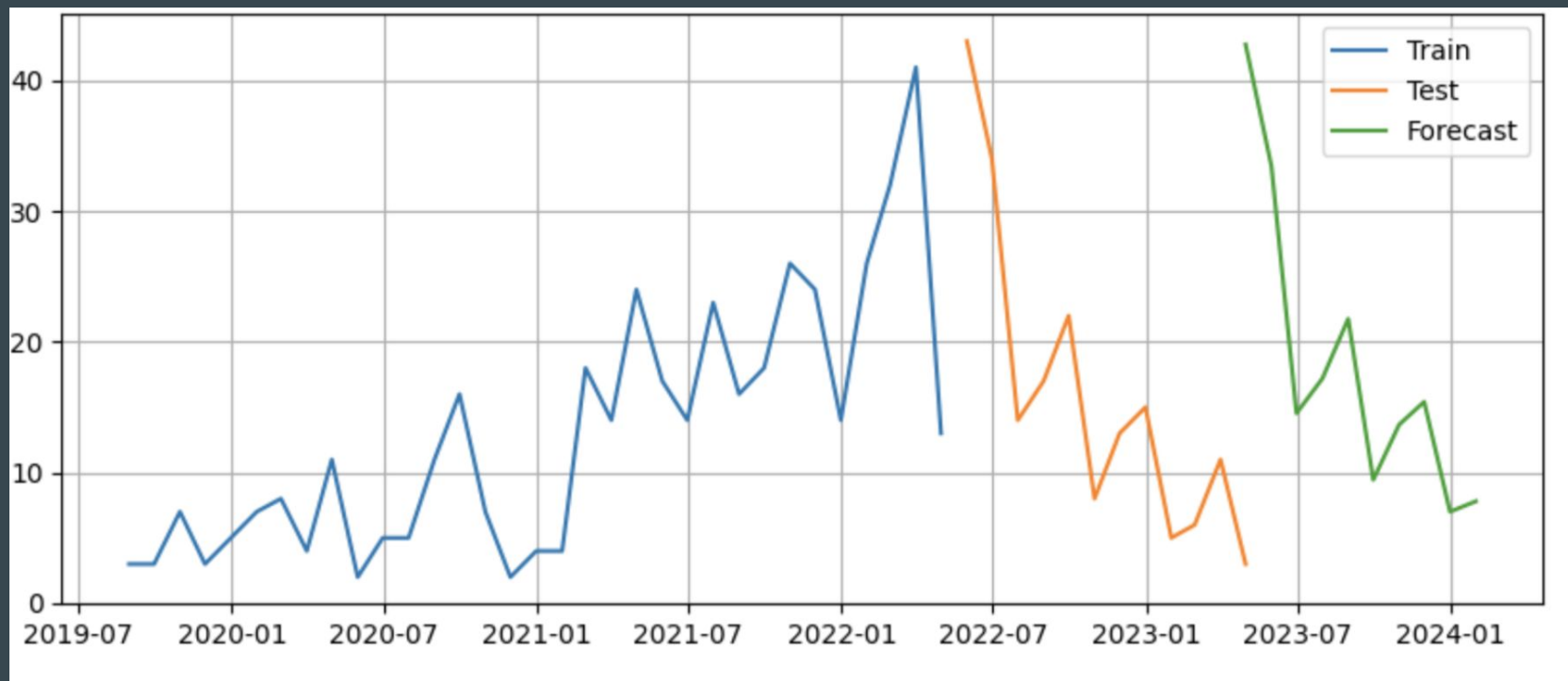# Total Permits Issued by Month and Year

# Community Boards With Highest Growth

**Borough**

- BRONX
- BROOKLYN
- MANHATTAN
- QUEENS
- STATEN ISLAND

# Time Series Analysis and Forecasting

# Time series Results:

- Average RSME: 25
- Bronx: 10
- Staten Island: 21
- Queens: 25
- Brooklyn: 32
- Manhattan: 40

# Recommendations:

- Brooklyn: Develop walk-up apartments.
- Bronx: Focus on mixed-use buildings.
- Manhattan: Invest in mixed-use properties.
- Queens: Build family-oriented houses.
- Staten Island: Consider waterfront properties.

# Limitations

- Heavy reliance on historical data.
- Omission of other crucial factors in the data scope.
- Geographical limitation to NYC-centric analysis.
- Assumptions in models that might not hold true.

# Further Analysis

- Inclusion of additional influential factors.
- Detailed borough analysis for micro-market trends.
- Refinement of predictive models.
- Application of methodology to different geographic areas.