# Analysis of Housing Data for Brooklyn, New York

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**1. Data Cleaning Process**

* Removed rows with empty values for
  + **NEIGHBORHOOD**
  + **BUILDING CLASS CATEGORY**
* Filtered out rows based on the following criteria.
  + **SALE PRICE** less than $1,000.
  + **GROSS SQUARE FEET** less than 150.
  + **LAND SQUARE FEET** either less than 1,000 or greater than 5,000,000.
  + YEAR BUILT set to 0 and whose BUILDING CLASS CATEGORY does not fall under GARAGE, VACANT LAND, PROPERTIES, or OTHER.
* Excluded rows with **ZIP CODE** equal to 0.

**2. Exploratory Data Analysis**

* 1. **Across Neighborhoods**

1. Trimmed Average Sale Price per Neighborhood

A screenshot of a computer

Description automatically generated

1. # Sales per Neighborhood

A green graph with black text

Description automatically generated

1. Sales per Building Class Category

A screen shot of a graph

Description automatically generated

1. Average Sale Price per Building Class in DOWNTOWN-FULTON MALL

A graph with purple squares

Description automatically generated

**2.2 Across Time**

1. Monthly Average Sale Price Change

A graph with a line going up

Description automatically generated

1. Monthly Trimmed Average Sale Price for Top 5 Neighborhoods

A graph showing the growth of a stock market

Description automatically generated with medium confidence

1. Monthly Trimmed Average Sale Price for Lowest 5 Neighborhoods

A graph showing the different colored lines

Description automatically generated with medium confidence

1. Number of Sales Transactions per Month

A graph of blue bars

Description automatically generated

**3. Parameter Estimation for Sale Price**

**3.1 Per Neighborhood Estimations**

* ***parameters.txt***

**3.3 Overall Estimations**

* **Range**

**Overall: 276946000**

**Highest: BROOKLYN HEIGHTS with 80575000**

**Lowest: DOWNTOWN-METROTECH and JAMAICA BAY with a range of 0. (Just 1)**

* **Median**

**Overall: 600000.0**

**Highest: JAMAICA BAY with 13,000,000.0**

**Lowest: GERRITSEN BEACH with a median of 320,000.0**

* **Average**

**Overall: 1016149**

**Highest: DOWNTOWN-FULTON MALL with 13684247.466666667**

**Lowest: GERRITSEN BEACH with an average of 290842.8.**

* **(Trimmed, 0.95) Mean**

**Overall: 697495**

**Highest: DOWNTOWN-FULTON MALL with 13684247.466666667**

**Lowest: GERRITSEN BEACH with a trimmed mean of 285307.39130434784.**

* **Standard Deviation**

**Overall: 3842142**

**Highest: DOWNTOWN-FULTON MALL with 21885308.09496563**

**Lowest: GERRITSEN BEACH with 151746.05081826265**

**(Excluding DOWNTOWN-METROTECH & JAMAICA BAY that have only 1 transaction)**

**4. Summarize**

1. **The Top 5 Expensive Neighborhoods with Low Sales *(See Figure 1 & 2)***

* **The priciest neighborhoods didn't sell many houses.**
* **These places might have super-fancy houses that not many people can afford. Or there just aren’t many houses available to buy, which makes them pricier.**

1. **Family homes in Brooklyn**

* **A lot of the houses sold in Brooklyn are family homes.**
* **Brooklyn seems to be a favorite spot for families. Maybe there are good schools and cool parks, or it’s just a nice place to live.**

1. **Expensive Stuff in Downtown-Fulton Mall**

* **The priciest buildings here are places like garages for businesses, and there aren’t many condo rentals being sold.**
* **Businesses might be doing well here since they're buying up expensive spaces.**

1. **BEDFORD STUYVESANT'S DEAL (*See Figure 1*)**

* **Lots of houses were sold here, even though they're not super expensive (Ranked 16th).**
* **What it could mean: This place might be a good deal for the price, so lots of people want to live here. It might also be getting more popular.**

1. **Price changes in Brooklyn (*See Figure 5*)**

* **House prices went up in November 2012, dropped a bit after, but then started rising again in March 2013.**
* **Something made the prices go up (Ex. a big fancy house was sold). And then prices fell a bit. But by March, they started climbing again, so people seem interested in buying again.**

1. **The Low-Price Beach (*See Figure 7 & 8*)**

* **GERRITSEN BEACH was the go-to place for cheap house prices, especially in December 2012 when overall sales in Brooklyn were at their highest.**
* **This place offers affordable house prices attracting many buyers. It might be popular with people who are buying a house for the first time or who don't want to spend too much.**