Apartment Hunting with Airbnb in Mind

Key Findings: For me, an average Airbnb rental in the city of Chicago does not produce enough revenue to justify the additional hassle and increased apartment cost (when comparing a 1-bedroom to a 2-bedroom). The major exception to this is in the Lincoln Park neighborhood on the North Side of Chicago, where a revenue based on average rental prices and labor estimates nets an income of $23.16/hr.

Author Noah Watkins

Key Questions I am planning a return to Chicago in the next twelve months; is it worth it for me to get a 2-bedroom instead of a 1-bedroom and rent the second bedroom out? How much would I realistically make after deducting the cost of the additional space? Are some neighborhoods better than others?

Data Sources Data Scraped from Airbnb.com; Zillow Chicago Rental Data via Kaggle.com; Chicago Area Zip Codes and Neighborhoods via Chicago.gov

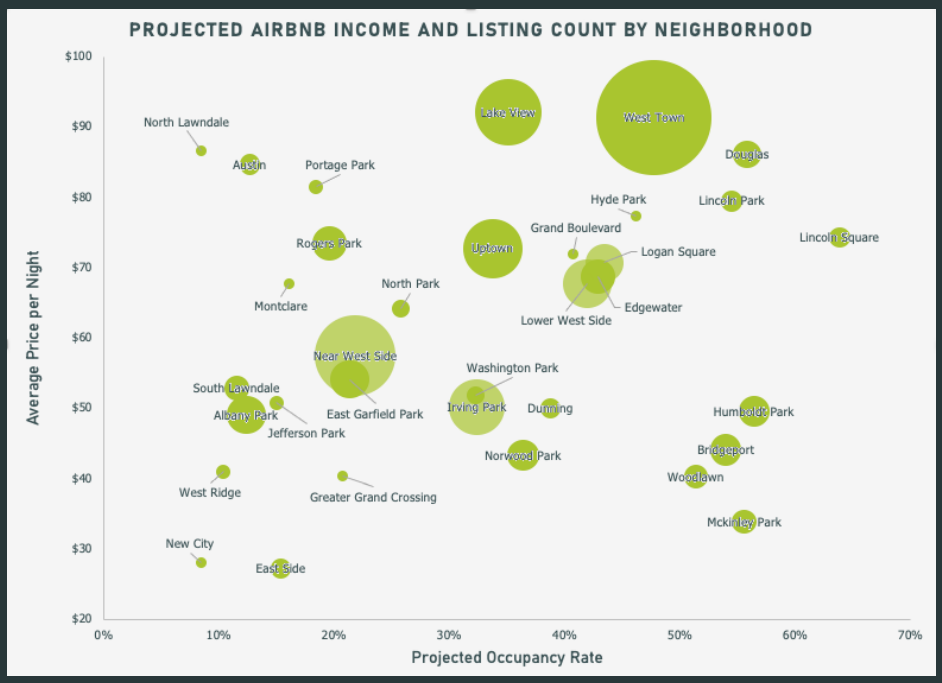
Methods

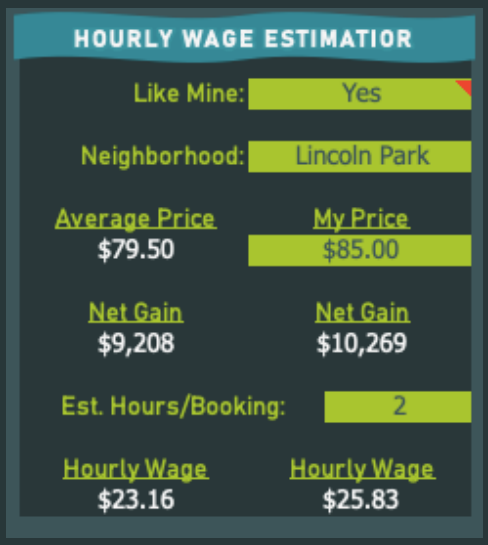
- Data Cleaning and Validation
  - Removed un-needed columns, duplicate rows, broken links, and inactive listings:
    - No availability in the next year, no reviews in the last year, or prices not listed/$0
  - Merged duplicated data labels and extracted IDs from URL's
  - Type checked all fields, converted strings to integers, and searched for nonsensical data
  - Assigned "Side" and "Neighborhood" values where missing based on Neighborhoods table

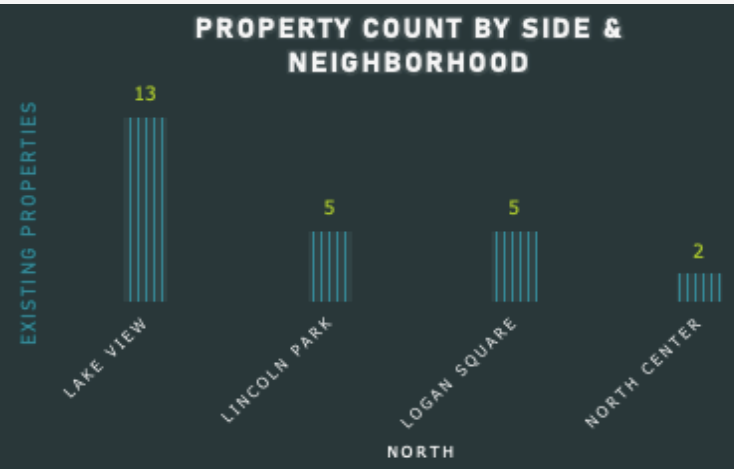
- Calculated Columns and Pivot Tables
  - Created an is_like_mine column based on what I already know I am searching for:
    - Private room, accommodates ≤ 2, 1 bedroom, not instantly bookable, short-term
  - Created a pivot table splitting Zillow data by bedroom count and neighborhood, allowing me to estimate the yearly cost increase accrued moving from 1 to 2 bedrooms for each neighborhood
  - Used the above two calculated fields and first/last review dates to estimate the number of years in operation, expected nights booked per year, projected revenue, and net gain
  - Created additional pivot tables and graphs to explore descriptive statistics and profitability broken down by neighborhood

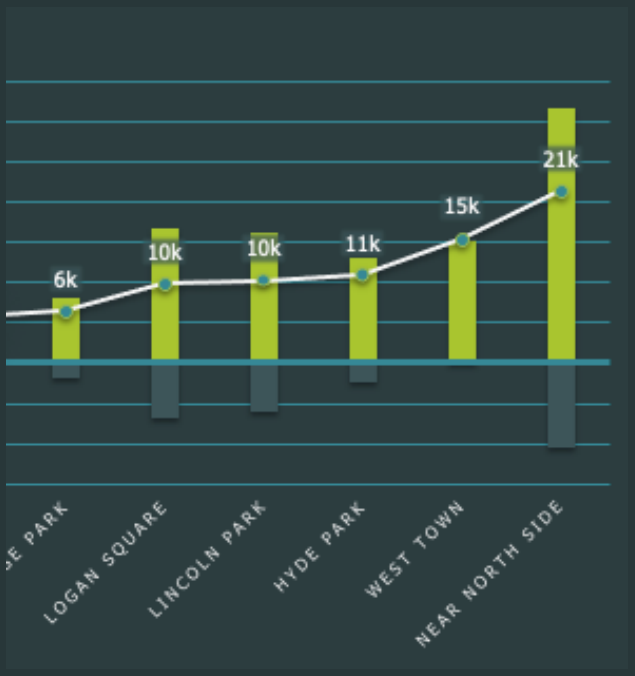
- Building the Dashboard
  - As I realized I needed a dynamic way to view and analyze data, I began building a dashboard with pivot charts focused on neighborhood accompanied by apt slicers.
  - I also created the final combo chart and the hourly estimator which finally answer the central questions: is it worth it? In what neighborhoods? What will profits look like?

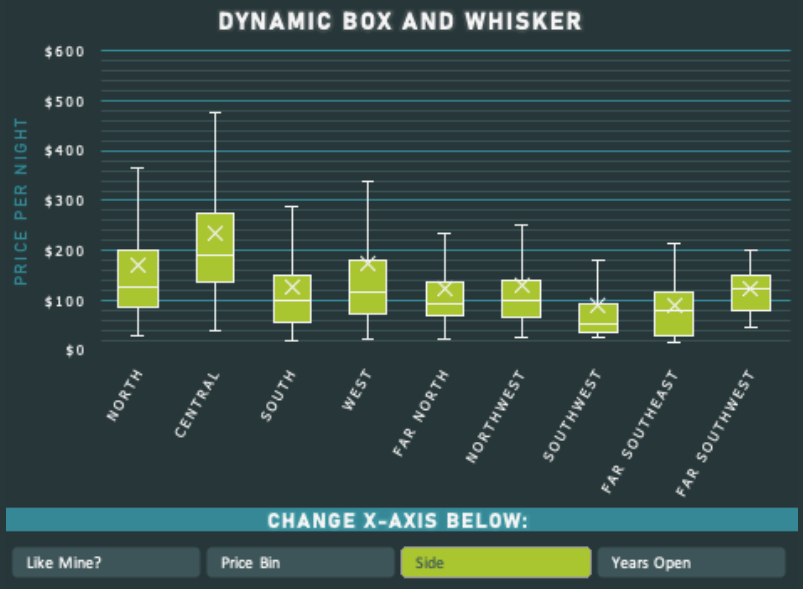
Results For full sized graphs with complete axes and interactive dashboard, please see accompanying file.











Findings

- After deducting the average cost of adding a second bedroom and filtering out listings that have been active for less than 1 year (in order to avoid confounding variables), the 5 most profitable neighborhoods are the Near North Side, West Town, Hyde Park, Lincoln Park, and Logan Square.
    - I am most interested in living on the North side, so I am primarily looking at Lincoln Park and Logan Square. I also noted Lakeview at spot 12, as it was the next highest on the North side.

- Based on this dataset and an estimation booking takes around 2 hours of work all told, the average Airbnb host makes $60.66/hour; however, when you only examine apartments like mine, that number drops to $16.48/hr.
    - Lakeview and Logan square net $11.93/hr and $12.96/hr. On the North side, only Lincoln Park is significantly higher, coming in at $23.16/hr.
    - Lincoln Park also has only 5 current listings, and the North side has the second largest IQR (skewing right), meaning that conditions are favorable for another rental.

- These figures are drastically lower than $60.66/hr overall average, leading me to conclude that renting rooms is nowhere near as profitable as renting houses or full apartments.

Recommendations The question of this project is ultimately one of worth. If I am insistent on living on the North side, then all neighborhoods except Lincoln Park pay too little for me to truly consider it. Even then, it is only worth if I can get a good deal and set a higher-than-average price. On the other hand, if I am willing to consider the South or West sides, there are many locations which could potentially offer me $30+/hr.

Assumptions and Limitations

- The following formula was used to calculate occupancy rate. This is in line with the way it was calculated in the initial dataset, although I used slightly different constants.
    - Projected Occupancy Rate = ((number of reviews in last twelve months) * 2 (around 50% of people leave a review) * 4.2 (average length of stay[1]))/365
    - Occupancy rate was capped at 90%. Any rate calculated above that was changed to that cap.

- The other major limitation is that I had to work as though each zip code refers to only one neighborhood. This is, in fact, not true for many of the neighborhoods, but because borders between these neighborhoods are merely symbolic, I do not believe this will affect the data unnecessarily.

- My Zillow dataset contains only 778 samples, which is a relatively small sample size, and does not include enough information to determine the average cost of upgrading in some neighborhoods.

Areas of Improvement If I were to continue working on this project, I would focus my efforts on the above limitations. Specifically:

- Use Python and geoJSON data to map listings by latitude and longitude in order to get a more accurate neighborhood count for both datasets

- Source a larger rental dataset to more accurately capture the market
    - This would allow large neighborhoods like West Town to be more accurately assessed

- Scrape data for an extended period and aggregate those findings to better predict actual occupancy

- Move the dashboard to another, more versatile platform like Tableau or PowerBI