# Storytelling Through Data Visualization

Final Exam

Dataset: Airbnb Boston

The dataset contains data related to Airbnb listings in Boston. It includes information such as the listing URL, scrape ID, last scraped date, source, name, description, neighborhood overview, picture URL, host details, host response time, host is superhost status, host neighborhood, host listings count, host verifications, host has profile picture status, neighborhood details, latitude, longitude, property type, room type, accommodation details, bathroom details, bedroom count, bed count, amenities, price, minimum and maximum nights, availability, calendar updates, number of reviews, review scores, license, instant bookable status, and calculated host listings count. This data can be used to analyze and compare different Airbnb listings based on various attributes and details. It provides insights into the location, property type, amenities, pricing, availability, and host information. This data can be used to identify popular neighborhoods, high-rated listings, and hosts with multiple listings. It can also help in understanding the distribution of reviews and availability of listings. Overall, this data provides a comprehensive overview of Airbnb listings, allowing for detailed analysis and reporting on various aspects of the listings.

Map Visualization:
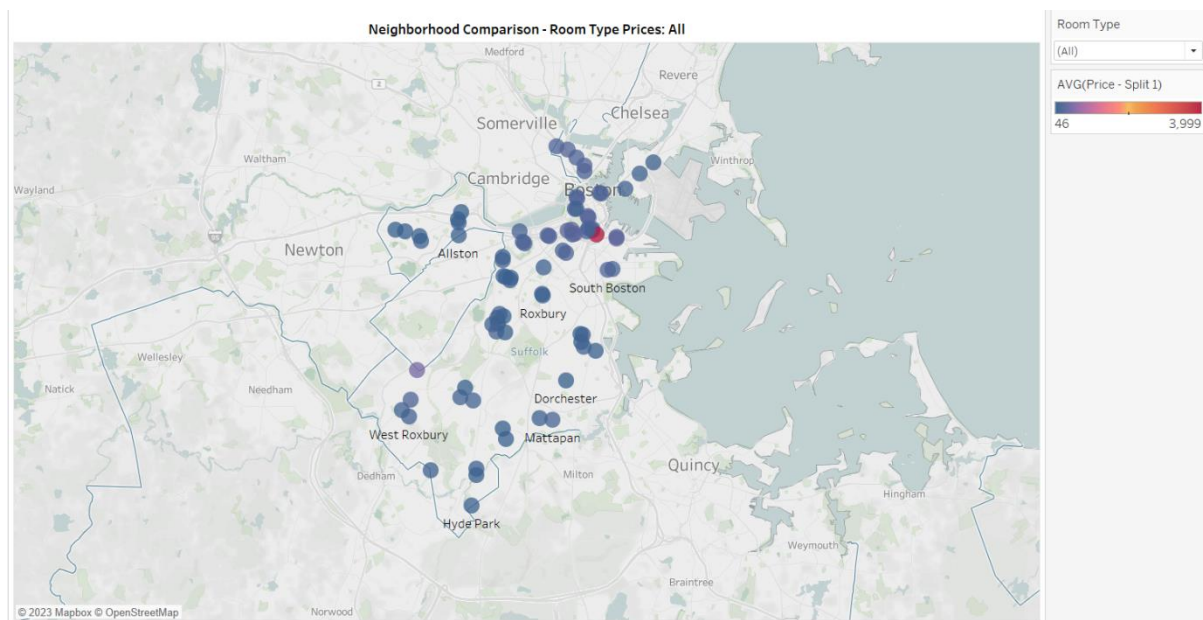
The map visualization tells the story of the wide range of Airbnb rental prices across Boston neighborhoods. It uses color to indicate that the downtown area, shaded in dark red, has the highest average price at $3,999 per listing. In contrast, Dorchester appears in dark blue,

visually communicating it has the lowest average price of just $46. The principle of similarity groups other neighborhoods by color based on affordability, with darker shades of red and orange indicating more expensive areas and blue showing cheaper options. The visual proximity of the colors allows viewers to quickly compare pricing in different regions. By leveraging closure through outlined neighborhood boundaries and pinpointed listings, the map forms a cohesive pricing narrative. It empowers us to draw insights into the varying costs of Airbnb rentals across Boston's diverse neighborhoods.

Line Chart 1:
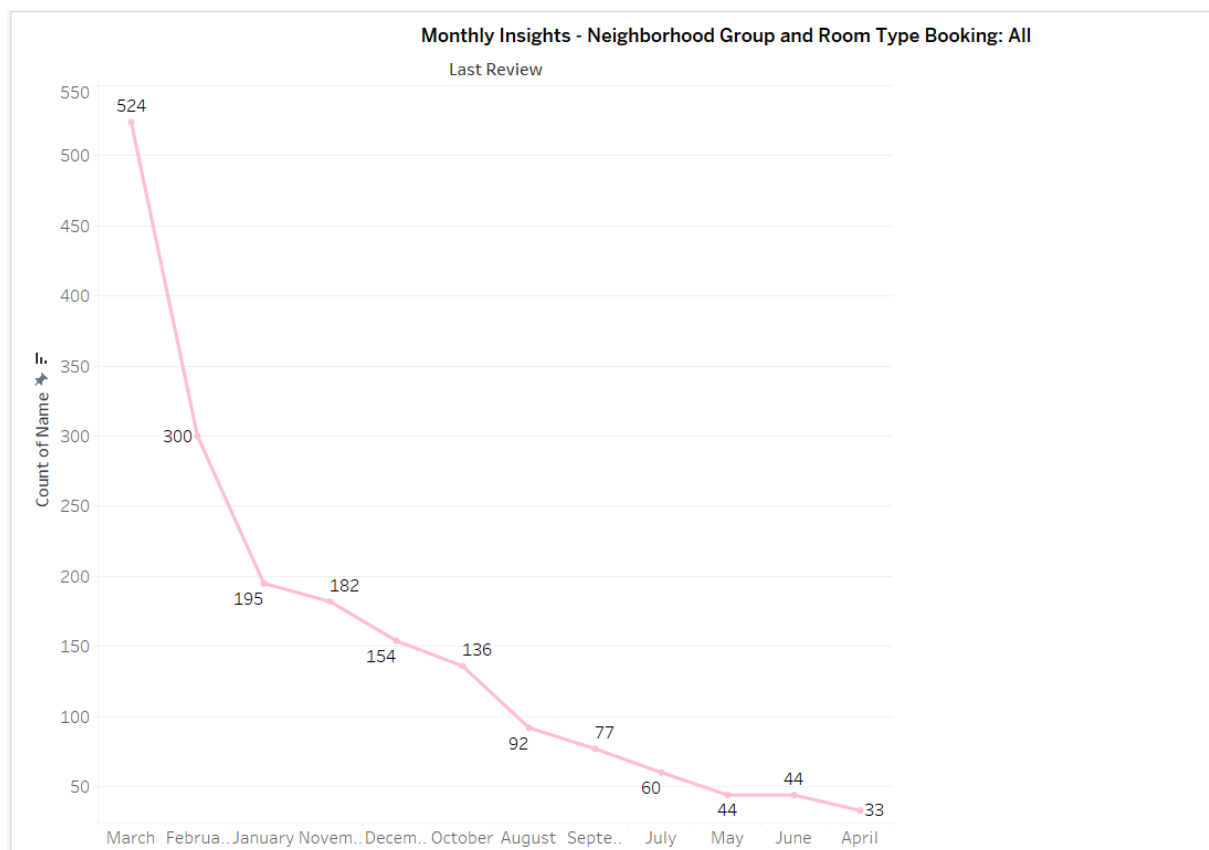
The line chart shows the growth trend of total annual reviews on Boston Airbnb listings over time. Reviews spiked in March and after that it started declining. This communicates that review activity was highest at the start, before experiencing a steady decline to the lowest point at the end. The linearly scaled axis allows viewers to interpret the slope of the line as a rate of growth or decline. The line chart format showcases the trend while smoothing incremental changes between data points.

Treemap:

This treemap utilizes nested rectangles distinguished by the Gestalt law of closure to break down listings by room type and neighborhood. The size principle shows the number of listings in each segment. For example, the label indicates Dorchester has the highest number of listings at 309. Logwood Medical Area has the smallest rectangle, indicating it has the fewest listings at just 2. Color further divides the rectangles by neighborhood. The varying sizes make it easy to compare the number of listings across different Boston neighborhoods briefly.
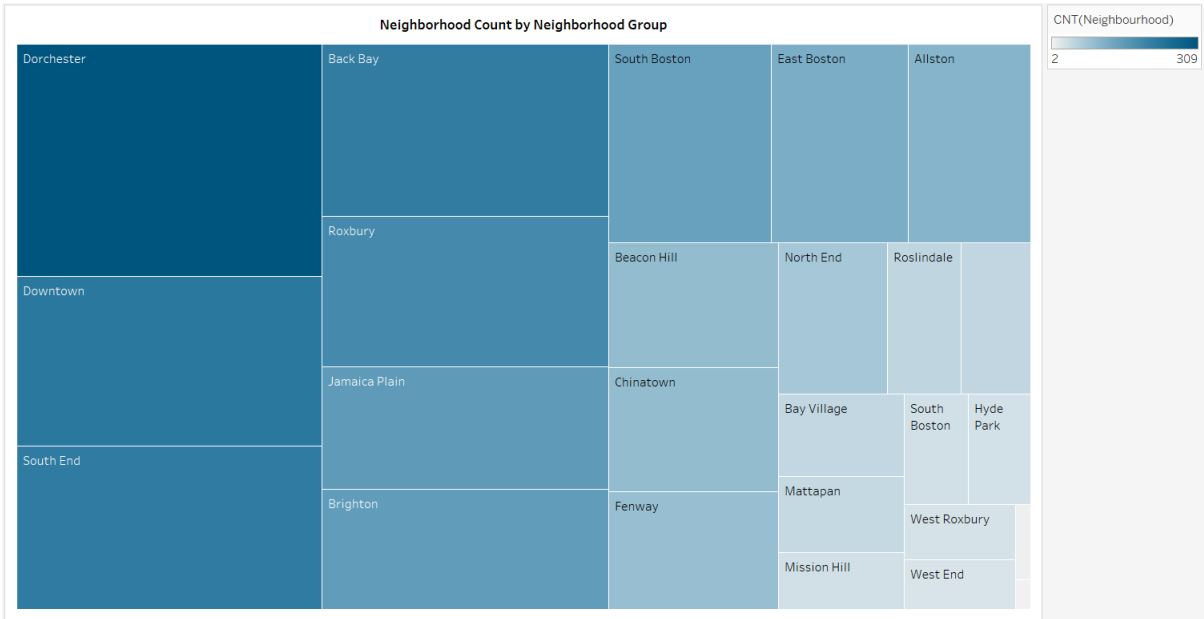

Horizontal Bar Chart:
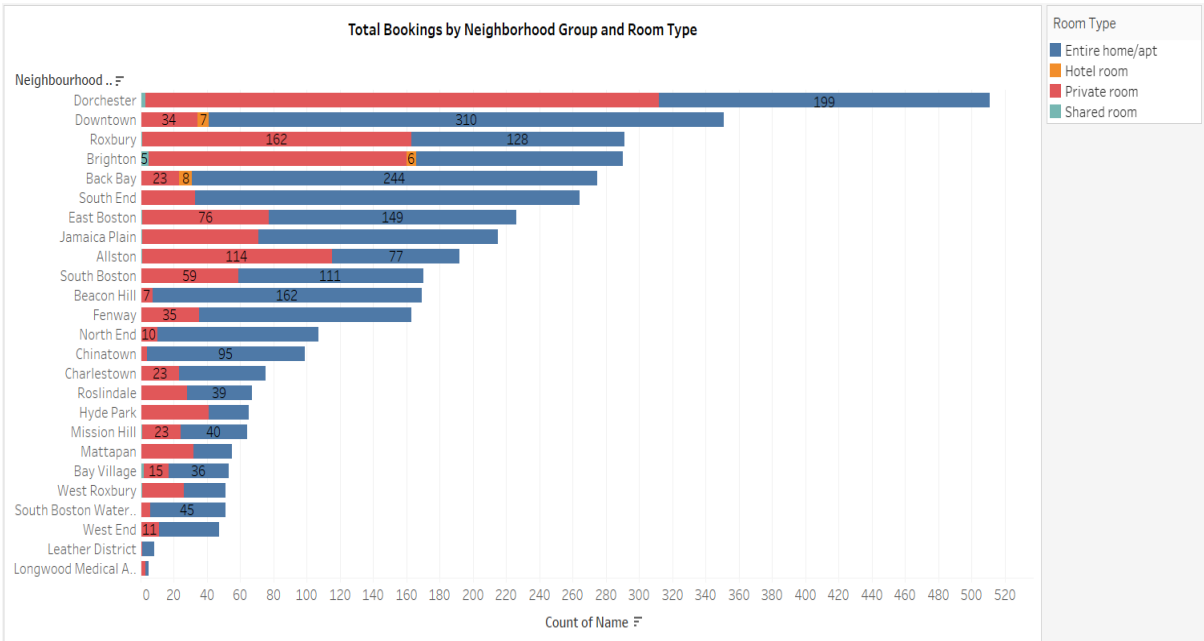
This horizontal bar chart displays the total number of Airbnb bookings across neighborhoods in Boston, broken down by room type. The length of each colored bar represents the count of bookings. Different colors are used to encode the room types - blue for entire home, orange for hotel room, red for private room, and green for shared room - utilizing the principle of similarity to group like colors. The chart is ordered from highest booking neighborhood on the left to lowest on the right. Dorchester had the highest overall bookings at 310, while Longwood Medical Area had the lowest at just 2 bookings. The varying bar lengths and colors make it easy to compare booking volumes across neighborhoods and room types. Overall, the visualization reveals neighborhood and room type trends for Airbnb bookings in Boston.

Line Chart 2:

This line chart depicts the total number of Airbnb reviews per year from 2014 to 2023. The y-axis quantifies the number of reviews from 0 to 120,000. The x-axis shows the review year. A blue line traces the annual number of reviews over time. The line chart reveals an upward trend in reviews starting at over 12 in 2014, peaking around 2018-2019 above 5356, and then descending to around 3567 by 2021 and in 2023 it increased to 114331. The visualization quickly communicates the rise and fall of review volume on Airbnb listings in Boston over the 10-year period. Overall, the line chart effectively leverages the continuity principle to depict the trend in review numbers over time.
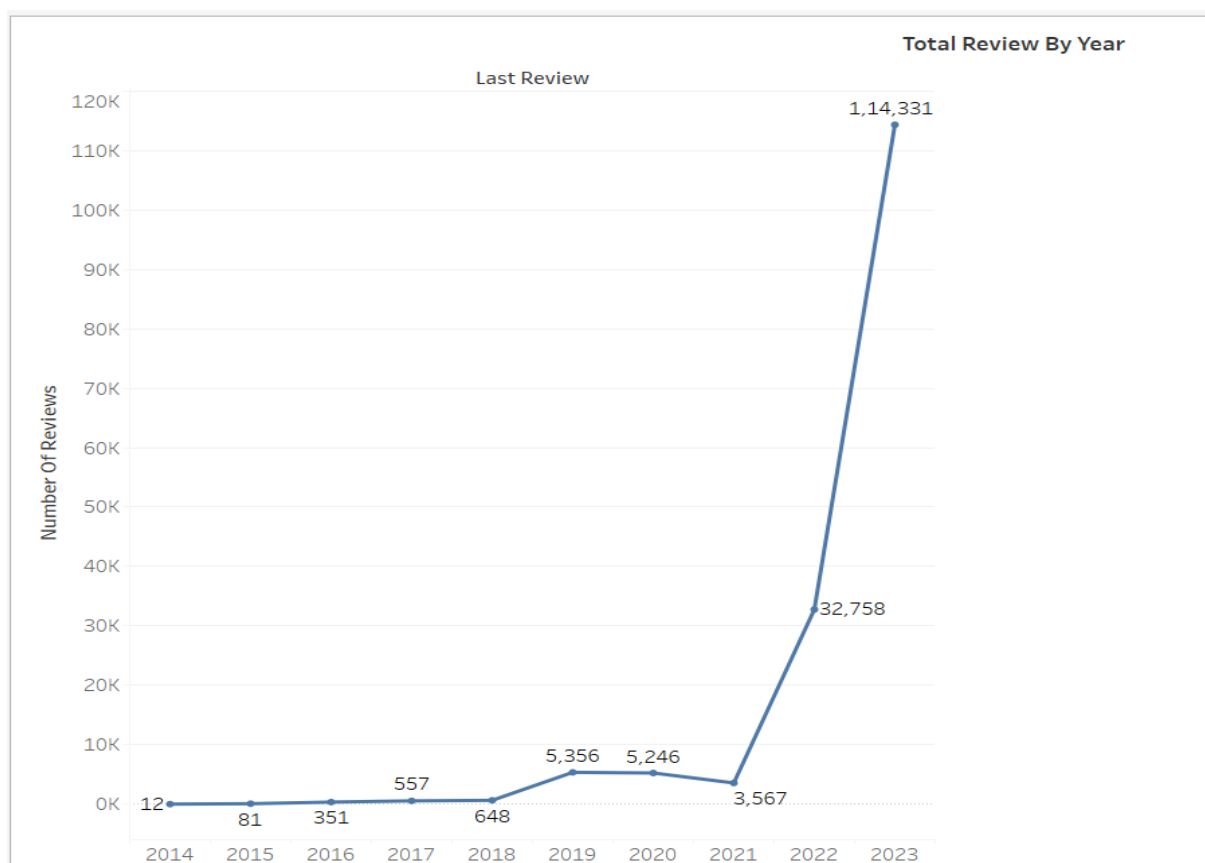
Text Table:

This table shows the average Airbnb price by neighborhood in Boston. The left column lists each neighborhood name. The right column displays the average price for listings in that area. Prices range from a low of $46 in Dorchester to a high of $3,999 in Boston. Sorting the table from low to high average price makes it easy to identify the most and least expensive areas. Overall, the tabular view enables a straightforward lookup of average listing price by neighborhood.

Average Price by Neighborhood Group: All

Neighbourhood	
Dorchster , Massach..	46
Allston, Massachuse..	68
Roslindale, Massach..	73
Dorchester , Massac..	73
Boston , Massachus..	78
Hyde Park , Massach..	80
Hyde Park, Massach..	80
Brighton, Massachu..	87
Boston (Jamaica Pla..	94
Dorchester, Massac..	97
Jamaica Plain, Mass..	97
波士顿, Massachuse..	100
Boston, Allston, Ma,..	120
Milton, Massachuse..	120
Dedham, Massachus..	129
Jamaica Plain , Mass..	135
West Roxbury, Mass..	136
Roxbury Crossing, M..	140
East Boston, Massa..	147
Jamaica Plain, Bosto..	150
ROXBURY CROSSIN..	173
Brookline, Massach..	192
Boston, Massachuse..	197
Charlestown, Massa..	217
Somerville, Massach..	249
Boston/Charlestown..	295
BOSTON, Massachu..	357
Chestnut Hill, Massa..	500
Boston, , Massachus..	3,999

Dashboard:

This Airbnb Boston dashboard brings together six complementary visualizations to analyze listings across various dimensions. The map provides geographical context, using color coding to showcase expensive downtown versus affordable Dorchester. The first line chart displays the growth trend of reviews over time, highlighting increasing popularity upfront before a decline. Switching to bookings, the horizontal bar chart compares volumes by

neighborhood and room type. The treemap focuses on distribution of listings across neighborhoods and room types. Transitioning to reviews again, the second line chart reveals the longer-term rise and fall pattern monthly. Finally, the text table lookups average prices by area.

Together these views tell a comprehensive story of Airbnb listing patterns in Boston. The dashboard applies strong data visualization principles to explore multiple metrics. It enables insights into neighborhood differences, temporal trends, and relationships between key attributes like price, reviews, and room types. The coordinated charts allow us to analyze from various angles. Additional filtering and interactivity could further empower exploration. Overall, the static dashboard provides a robust overview of Airbnb data, controlling information flow to highlight key aspects.
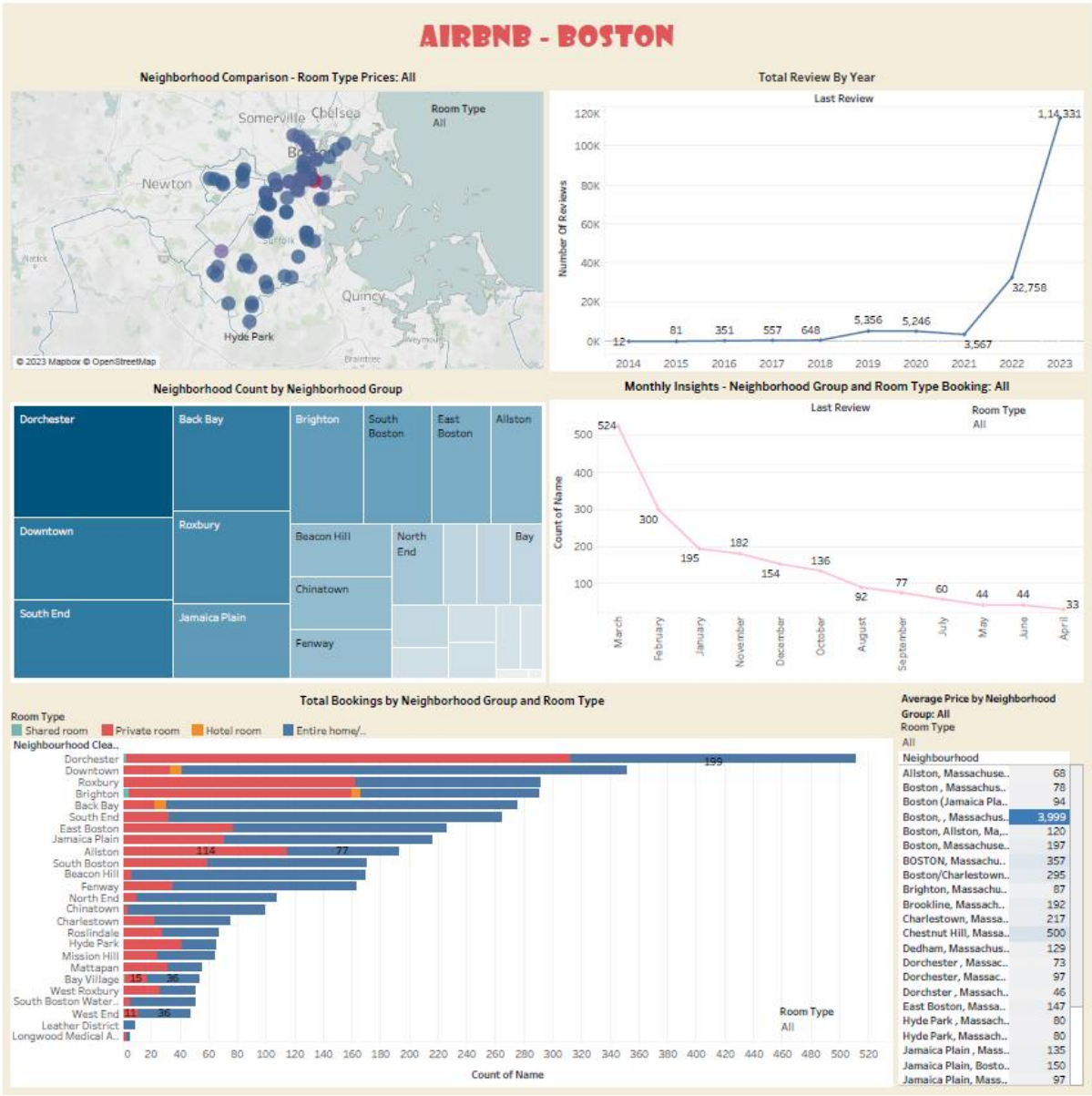
My process and insights from developing visualizations for Airbnb Boston dataset:

Data Exploration and Preparation

- After importing the data into Tableau, I did an initial scan of the fields and records to understand what was included. I saw details on listings, hosts, reviews, prices, locations etc.

- Before visualizing, I had to do some data prep like splitting the price column as it contain a dollar sign which is consider as string. I converted this into a number column. This enabled accurate analysis.

Visualization Brainstorming

- Based on wanting to see geographic, temporal, and attribute comparisons, I sketched ideas for charts like maps, line graphs over time, treemaps for categories, and tables for lookup.

- I considered advanced visuals like packed bubble to showcase patterns across multiple dimensions in engaging ways.

Iterative Design and Development

- I built the visuals in Tableau, iteratively tweaking design choices like chart types, color schemes, axis scales, and layouts.

- For each chart, I focused on applying principles like Gestalt laws to optimize how the data patterns communicated insights.

- I also refined the visuals based on the target audience needs for actionable insights.

Key Data Insights

- The map revealed almost a $4,000 price difference between expensive downtown vs affordable Dorchester listings.

- The reviews line chart showed a clear spike in popularity in early years before declining over time.

- The treemap displayed varying demand for room types across neighborhoods.

Audience Perspectives

- For hosts, the room type and price data could inform listing optimization.

- For travelers, the geographic view of prices helps find affordable options in their target areas.

In summary, thoughtful data prep, visualization design, and audience perspectives were key to developing this insightful dashboard.