Project Objectives

The primary goal is to guide your client on which property types to invest in within the Manhattan area by analyzing Airbnb data to determine the most attractive neighborhoods and property sizes for vacation rentals.

Data Analysis Steps

Data Cleaning and Preparation:

Neighborhood Data: Clean the neighborhood column by removing inconsistent capitalization and trailing spaces, storing cleaned values in a new column called neighborhood_clean.
Bedroom Data: Address missing entries in the bedrooms column (where empty implies studios) by filling these with zero, storing results in bedrooms_clean.

Data Analysis using Pivot Tables:

Attractive Neighborhoods: Use the number_of_reviews_ltm to identify the top 10 neighborhoods indicating their attractiveness based on rental frequency. The neighborhoods identified include Lower East Side, Hell's Kitchen, and Harlem.
Property Sizes: Analyze the most popular property sizes (number of bedrooms) across all listings and then specifically within the top neighborhoods to determine if preferences vary by location. The most popular sizes are studios, 1-bedroom, and 2-bedroom properties.
Neighborhood Specific Preferences: Update the pivot table to recommend specific property sizes for each of the top 10 neighborhoods, with a focus on the most popular size for each.

Financial Analysis:

Revenue Calculation: For the most attractive listings (top neighborhoods and popular property sizes), calculate potential earnings by summing adjusted_price for days when properties were booked, and estimate annual revenue by extrapolating this data.
Top-Earning Listings Identification: Use the revenue data to rank listings, identifying the highest earners and estimating their annual revenue potential. The top-earning listing generated significant revenue, suggesting a strong investment opportunity.
Documentation and Reporting
Executive Summary: Provide a concise overview of findings and recommendations for investment focusing on the identified top neighborhoods and property sizes.
Change Log and Assumptions: Document all data cleaning steps, assumptions made during analysis (such as the relationship between reviews and rental frequency), and any decision-making processes that affected the analysis.
Formatting Consistency: Ensure that the spreadsheet maintains consistent formatting, including font styles, sizes, borders, and colors to enhance readability and professionalism.
Deliverables
Pivot Tables: For analyzing neighborhood attractiveness and property size popularity.
Revenue Analysis: Detailed tables and possibly graphs showing potential earnings for recommended listings.
Summary Report: A well-organized spreadsheet with all analyses clearly presented, along with an executive summary and table of contents.

By following this structured approach, the project will provide actionable insights into the most lucrative investment opportunities in the Manhattan vacation rental market, backed by data-driven analysis. This will help your client make informed investment decisions in selecting the right properties to enhance their portfolio and maximize returns.

Setup and Preparation			Assumptions:	
Acquire Data: Obtain the latest NYC Airbnb data.			Clearly state any assumptions made during the analysis.	
Review Data: Initial inspection to understand the structure and contents.				
Create Copies: Duplicate the raw data to preserve the original state for reference.			Executive Summary and Table of Contents:	
			Draft an executive summary that encapsulates key findings and recommendations.	
Data Cleaning			Organize the report with a table of contents for easy navigation.	
Standardize Neighborhood Names:			Finalization and Presentation	
Remove inconsistent capitalization and trailing spaces.				
Store cleaned values in a new column neighborhood_clean.				
			Change Log:	
Address Missing Bedroom Data:			Document every step taken, from data cleaning to analysis modifications.	
Interpret empty cells in the bedrooms column as zero (indicating studios).				
Create bedrooms_clean using an IF function to fill empty cells with 0.			Visualizations:	
			Include bar charts or other graphical representations to illustrate key points, such as the number of reviews for the top 10 listings.	
Data Analysis				
Analyze Neighborhood Attractiveness:			Estimate Annual Revenue:	
Construct a pivot table using neighborhood_clean and number_of_reviews_ltm.			Highlight potential annual earnings by extrapolating from monthly data.	
Identify the top 10 most attractive neighborhoods.				
			Formatting Consistency:	
Property Size Popularity:			Ensure uniform formatting across the spreadsheet for a professional look.	
Build a pivot table to determine the most popular property sizes (bedrooms_clean).				
Investigate if different neighborhoods have distinct preferences for property sizes.				
Financial Analysis				
Revenue Calculation:				
Add a revenue_earned column to the calendar data, set based on rental status (available = 'f').				
Use the SUMIF() function in the listings data to aggregate revenue.				
Create a pivot table to rank listings by revenue using top_listing as a filter.				
Documentation and Reporting				

Table of Contents

Executive Summary

Overview of findings and strategic recommendations.

Project Introduction

Purpose of the analysis.
Brief description of the dataset and scope.

Data Overview

Summary of the datasets involved (listings and calendar).
Key attributes and their relevance to the project.

Data Preparation and Cleaning

Description of initial data issues (e.g., missing values, inconsistencies).
Steps taken to clean and prepare the data for analysis.

Analysis and Findings

5.1 Attractiveness by Neighborhood
Methodology for determining neighborhood attractiveness.
Top 10 neighborhoods based on Airbnb activity.
5.2 Property Size Analysis
Analysis of property sizes and their popularity.
Comparison of property size preferences across neighborhoods.
5.3 Revenue Analysis
Approach for estimating potential revenue from top listings.
Identification of the highest earning listings and their characteristics.

id	neighborhood_clean	top_neighborhood	Top Listing	revenue_earned	annual-revenue	bedrooms_clean	number_of_reviews_ltm
82638	East Village	1	1	3549	42588	1	3
9357	Hells Kitchen	1	0	5250	63000	0	0
57618	Hells Kitchen	1	1	7500	90000	1	7
57754	Flatiron District	0	0	9570	114840	1	28
57874	East Harlem	1	1	4320	51840	1	55
15341	Lower East Side	1	1	2729	32748	1	6
59014	Lower East Side	1	1	5750	69000	1	1
59709	Chinatown	0	0	8100	97200	2	23
60164	Tribeca	0	0	3500	42000	3	3
16974	East Harlem	1	0	7350	88200	4	26
60611	East Harlem	1	1	3300	39600	1	1
107895	Upper West Side	1	0	4980	59760	0	2
17037	East Village	1	1	6600	79200	1	0
60680	East Village	1	1	4800	57600	1	2
61509	Midtown	1	0	3300	39600	1	0
62427	East Village	1	1	3120	37440	1	1
19159	Harlem	1	0	3190	38280	2	0
62891	East Village	1	0	4725	56700	0	9
116551	Harlem	1	0	2100	25200	0	2
63693	East Village	1	0	11700	140400	2	0
23686	West Village	1	0	14250	171000	3	3
123784	Harlem	1	0	2739	32868	0	33
126443	East Village	1	0	12852	154224	2	60
27644	Harlem	1	1	4750	57000	1	18
65425	Nolita	0	0	3075	36900	2	10
29683	Lower East Side	1	1	5550	66600	1	2
66251	East Village	1	0	9776	117312	0	32
140973	East Village	1	0	6450	77400	2	4
67288	East Harlem	1	1	3665	43980	1	7
144087	Harlem	1	0	9584	115008	2	7

listing_id	date	available	price	adjusted_price	revenue_earned	minimum_nights	maximum_nights
9357	2022-09-07	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-08	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-09	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-10	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-11	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-12	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-13	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-14	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-15	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-16	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-17	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-18	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-19	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-20	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-21	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-22	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-23	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-24	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-25	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-26	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-27	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-28	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-29	f	$175.00	$175.00	$175.00	30	1125
9357	2022-09-30	f	$175.00	$175.00	$175.00	30	1125
9357	2022-10-01	f	$175.00	$175.00	$175.00	30	1125
9357	2022-10-02	f	$175.00	$175.00	$175.00	30	1125
9357	2022-10-03	f	$175.00	$175.00	$175.00	30	1125
9357	2022-10-04	f	$175.00	$175.00	$175.00	30	1125
9357	2022-10-05	f	$175.00	$175.00	$175.00	30	1125
9357	2022-10-06	f	$175.00	$175.00	$175.00	30	1125

neighborhood_clean	SUM of number_of_reviews_ltm
Lower East Side	6242
Hells Kitchen	5506
Harlem	5157
Midtown	4128
Upper West Side	3497
Chelsea	2913
East Village	2572
East Harlem	2175
West Village	1735
Upper East Side	1696
Grand Total	35621

Reviews of Top Neighborhoods
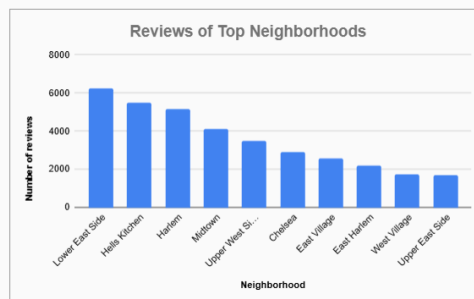
bedrooms_clean	COUNTUNIQUE of id	SUM of beds	SUM of calculated_host_listings_count_entire_homes
0	441	627	5812
1	1265	1759	41283
2	526	1372	2316
3	150	545	609
4	43	223	176
5	9	56	24
6	2	18	3
7	1	10	3
8	1	9	1
Grand Total	2438	4619	50227

bedrooms_clean	COUNTA of neighborhood_clean
1	146
2	74
0	48
3	26
4	12
5	5
Grand Total	**311**

id	SUM of revenue_earned
49946551	29940
44267714	26100
6833395	22800
46432776	20300
41295029	15600
53057804	15300
53058987	14425
4859903	14233
43118961	13601
4967114	13500
289665	13500
50618605	13050
1060019	13021
580013014809987573	12930
30087377	12810
25313748	12785
34384453	12609
49928900	12236
53167175	12225
53602040	12135
41890621	11970
37251520	11850
48374098	11610
52755593	11600
52336155	11600
39225271	11575
29687597	11571
13058232	11500
29495933	11455