Apartments in the USA

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Objective

Analyze our data to find most important factors to customers when they are shopping for apartments.

We will attempt to answer the following questions:



Seasonal Trends

Are there any trends in apartments prices throughout the year?

Regional Variations

How do apartment prices vary by state and by city?

Value

What is more important to renters - more bed/bath or more square feet?

Our Dataset

- ➤ 10,000 apartment listing classifieds
- Includes data such as price, bed/bath, location, etc.



```
Data columns (total 13 columns):
    Column
                        Non-Null Count Dtype
    Unnamed: 0
                        99004 non-null int64
    id
                        99004 non-null int64
    bathrooms
                        99004 non-null float64
    hedrooms
                        99004 non-null float64
    fee
                        99004 non-null object
    price
                        99004 non-null float64
    square feet
                        99004 non-null int64
    cityname
                        99004 non-null object
    state
                        99004 non-null object
    latitude
                        99004 non-null float64
10 longitude
                        99004 non-null float64
11 date
                        99004 non-null datetime64[ns]
12 price per square ft 99004 non-null float64
dtypes: datetime64[ns](1), float64(6), int64(3), object(3)
```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 99004 entries, 0 to 99003

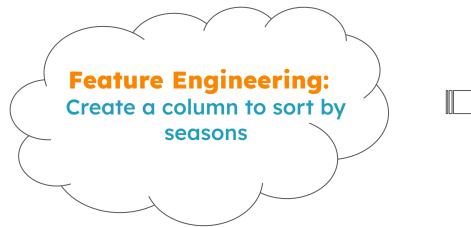
memory usage: 9.8+ MB



Questions to ask yourself before renting or buying

Question 1:

Are there any trends in apartments prices throughout the year?





Ability to see seasonal trends

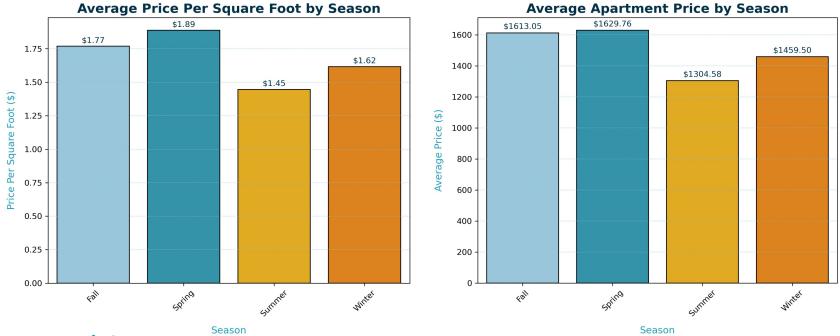


Winter and Fall have the most data



Fall and Spring have the highest average rental price

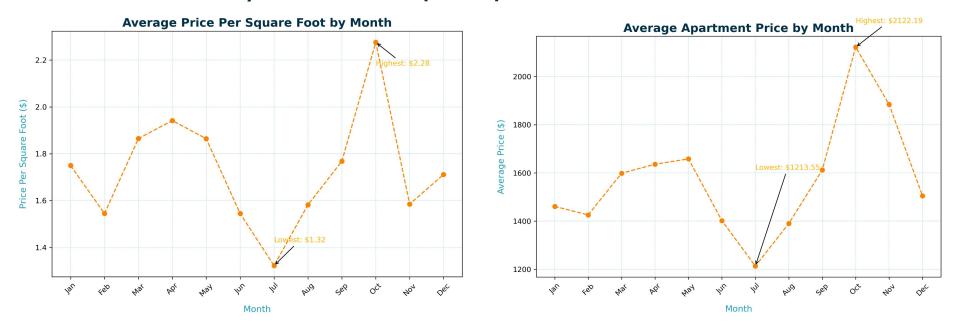
Seasonal Trends: Price per Square Foot vs Rental Price



Key Insights

- Demand is HIGHEST in Spring and Fall
- Best value for size is during Summer when demand is low

Monthly Trends: Price per Square Foot vs Rental Price

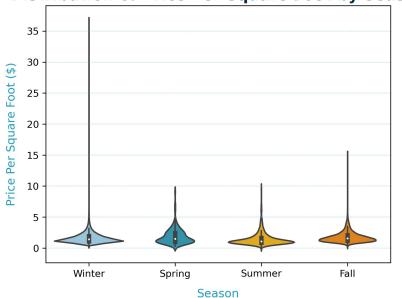


Key Insights

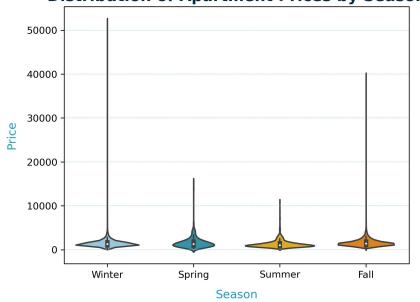
- Demand is HIGHEST in October
- Best value for size is in July when demand is low

Seasonal Distribution: Price per Square Foot vs Rental Price

Distribution of Price Per Square Foot by Season



Distribution of Apartment Prices by Season



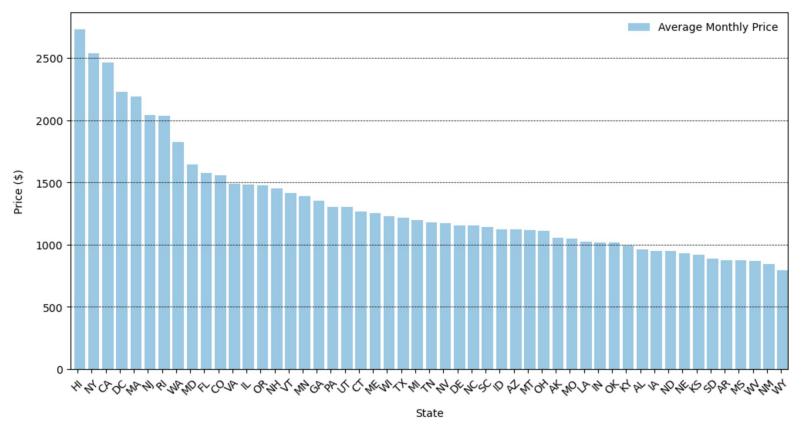
Key Insights

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Question 2:

How do apartment prices vary between states and cities?

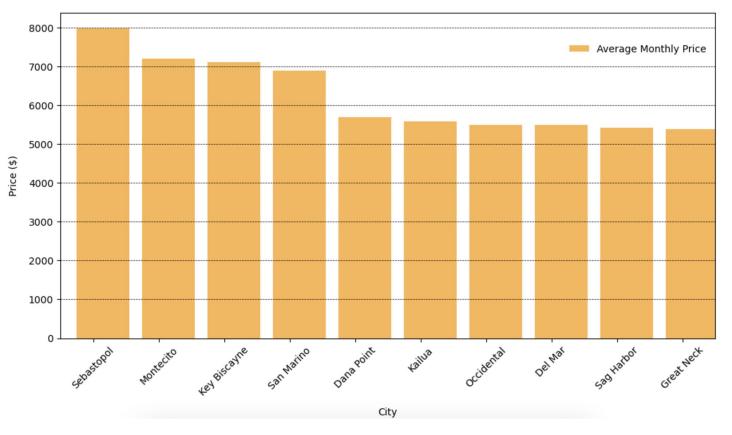
What are the average prices in each state?



Most expensive: Hawaii, New York, California

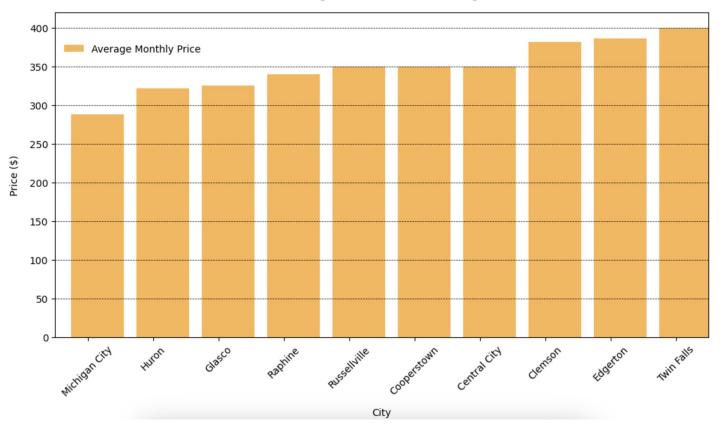
Least expensive: Wyoming, New Mexico, West Virginia

What are the top 10 most expensive cities?



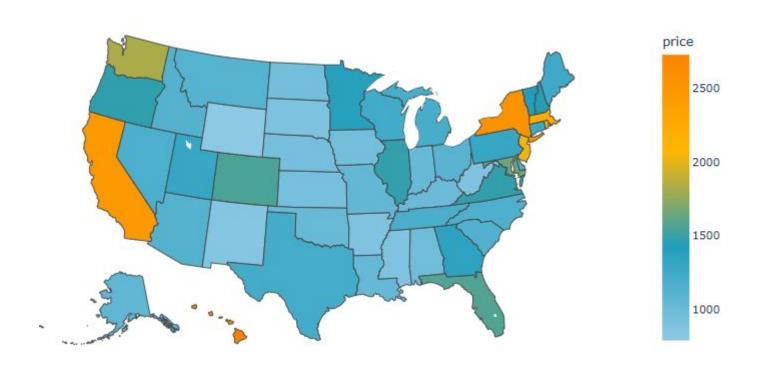
Most expensive: Sebastopol (California), Montecito (California), Key Biscayne (Florida)

What are the top 10 least expensive cities?



Least expensive: Michigan City (Michigan), Huron (Ohio), Key Biscayne (Kansas)

Average Apartment Prices by State in the U.S.



Question 3: What is more valuable to renters—having more bedrooms and bathrooms or having more square footage?

Dataset:

- Source: Cleaned apartment pricing dataset (clean_data.csv).
- Key Columns:
 - Independent variables: Price, bathrooms, bedrooms, square_feet.
 - Location identifiers: cityname, state.

Sample Size:

Total rows: 99004

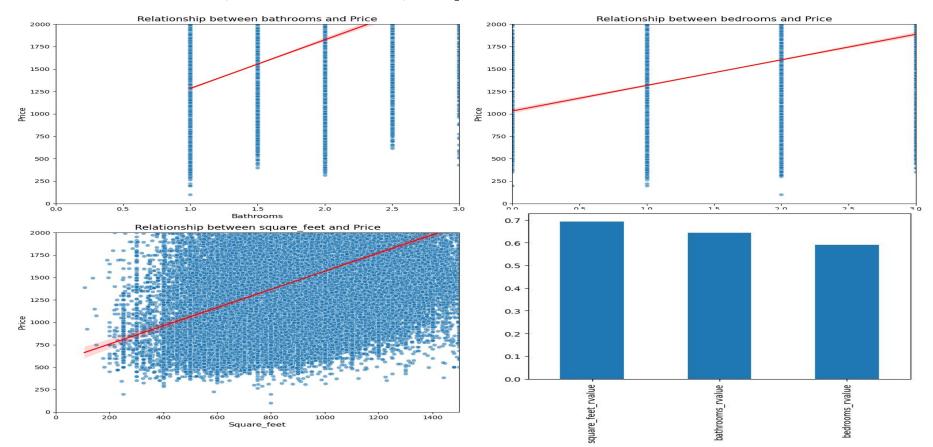
Preprocessing:

- Filtered by city and state.
- Removed null and inconsistent values.
- Performed linear regression for each feature against price.
- **Slope**: Measures rate of price change per unit of the feature.
- **R-value**: Correlation strength between the feature and price.

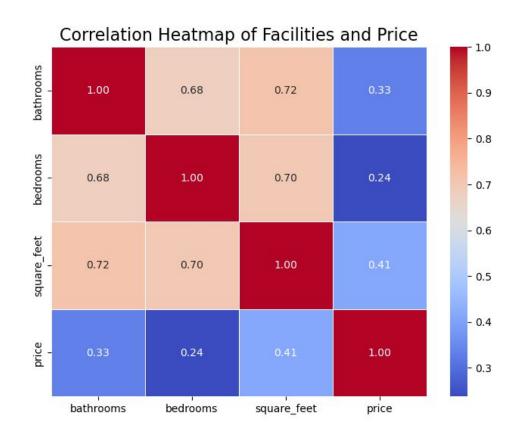
regression_df.dropna().mean(num eric_only=True).sort_values(ascen ding=False)

bedrooms_intercept	891.829137
bathrooms_intercept	759.044683
square_feet_intercept	575.248475
bathrooms_slope	490.249934
bedrooms_slope	324.670734
square_feet_slope	0.921991
square_feet_rvalue	0.745016
bathrooms_rvalue	0.648925
bedrooms_rvalue	0.610532

Q 3: Bar / Scatter plots: Relationship between price and "bathrooms", "bedrooms", "square_feet"



Q 3: Correlation heatmaps for overview

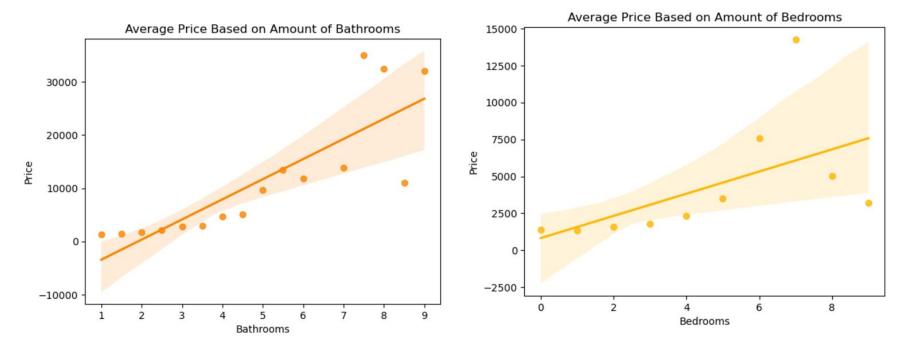


Summary:

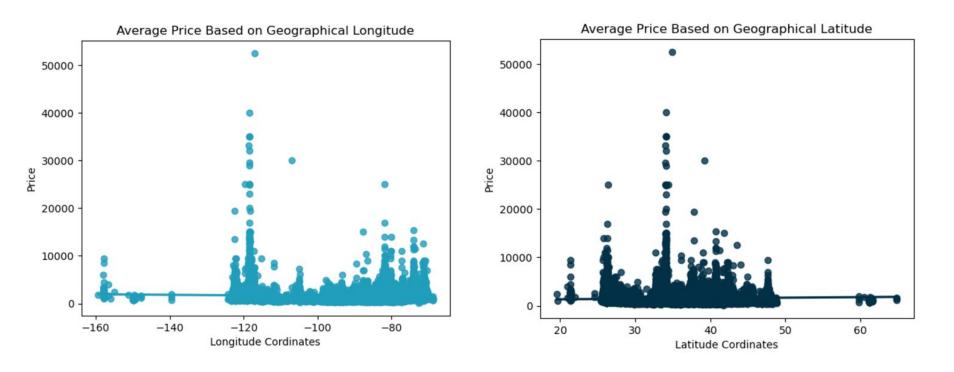
- Square Feet is the most significant predictor of price.
- Variability in bathrooms and bedrooms impact across cities.
- Strong correlations highlight critical factors for pricing strategies.

Key Takeaways:

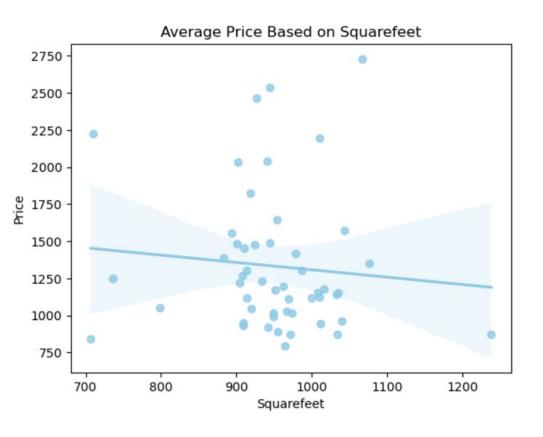
 For potential investors: Building more bathrooms is more benefit than more bedrooms. **Regressions** (what variables have most noticeable regressions?) (what kind of regressions appear in our data?)



Regressions: Little to no correlation



(Interesting regression)



- Confidence interval

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Conclusion

- Question 1: Fall and spring have higher prices...
- Question 2: California, New York, and Hawaii...
- Question 3: ...