- **Project Title:** *“Income, Mortgage & Housing Insights: A State & City Analysis”*
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- , Role: Data/Business Analyst
- Date: 2025-09-13

Problem Statement

- Housing affordability issue in US cities & states
- Why mortgage rates + income matter
- Objective: *“To analyze state & city housing trends and affordability using data analytics.”*

Data Sources

- BigQuery (mention dataset used: housing, income, mortgage rates)
- Data size / structure (States, Cities, Years, Metrics)
- Python used for preprocessing

Methodology / Workflow

- Flowchart (BigQuery → Python Cleaning → Calculations → Power BI Dashboard)
- Key processing: Median house price, Avg income, Affordability Index = Price ÷ Income

Exploratory Data Workflow

Step 1: Synthetic Data (Python)

Created synthetic datasets (Housing, Demographics, Mortgage)

Exported them as CSV for further use

Step 2: Cloud Data Management (BigQuery)

Imported CSVs into Google BigQuery

Wrote SQL queries to aggregate & join datasets

- Example: Avg House Price by State
- Example: Household Income distribution

Step 3: Visualization (Power BI)

Imported processed BigQuery tables into Power BI

Built interactive dashboards (KPIs, Trends, Drillthroughs)

BigQuery Part :-
Title: *Data Aggregation & Analysis (BigQuery)*

Google Big Query

•Imported synthetic datasets (housing_prices, demographics, mortgage_rates) from CSV into BigQuery tables.
•Used **SQL queries** for:

- **State-wise Average House Price Trends**
- **Top 10 Expensive Cities (Avg Price)**
- **Income vs House Price Correlation**
- **Mortgage Rate Impact on House Prices**
- **Affordability Index (Price ÷ Income)**

•Ensured queries are **sandbox-friendly** (optimized, grouped, aggregated).
•Exported processed tables → directly connected to Power BI.

Google Cloud | My Project 5444 | Search (/) for resources, docs, products, and more | Search

BigQuery

Sandbox Set up billing to upgrade to the full BigQuery experience. Learn more | Dismiss | Upgrade

- Studio
- Pipelines & Integration
  - Data transfers
  - Dataform
  - Scheduled queries
  - Scheduling
- Governance
  - Sharing (Analytics Hub)
  - Policy tags
  - Metadata curation
- Partner Center
- Settings Preview
- Release Notes

Explorer | + Add data

Search BigQuery resources

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    - Shared data preparation
  - Pipelines
  - External connections
- housing-471904

Repository Preview

*US Hou... ing | demogr...ics | housing... ces

US Housing and Marketing | Run | Download | Share | Save query

```sql
-- State-wise Average House Price Trends
SELECT
State,
Year,
AVG(Median_House_Price) as avg_price
From `housing-471904.us_housing.housing_prices`
GROUP BY State, Year
ORDER BY Year, avg_price DESC;

-- Top 10 Expensive Cities (Avg Price)
Select
City as Expensive_Cities,
Avg(Median_House_Price) as Avg_Price
From housing-471904.us_housing.housing_prices
Group by City
ORDER BY City,Avg_Price;

-- Correlation: Income vs House Prices
```

This script will process 16.76 KB when run.

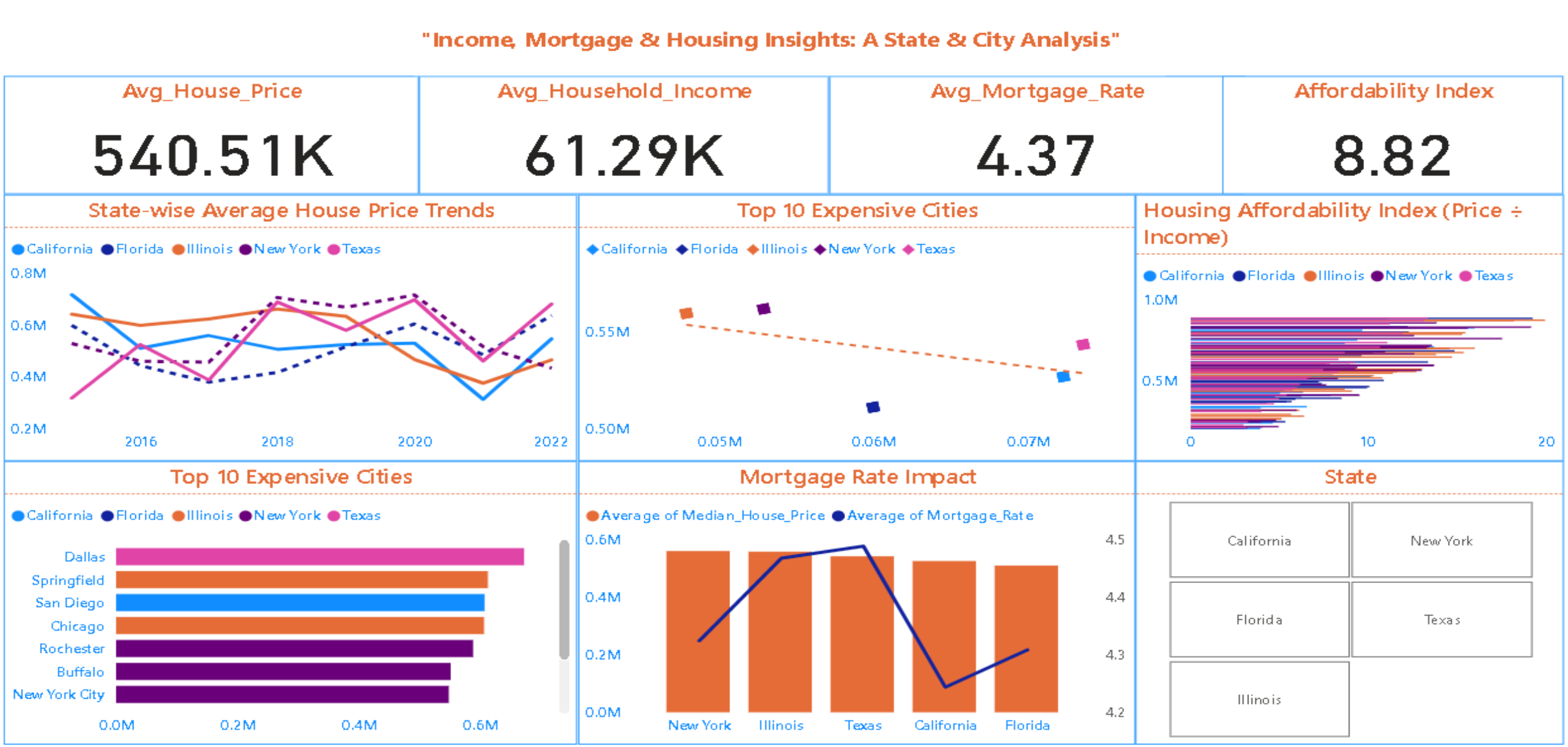
Query results | Save results | Open in

Job information | Results | Visualization | JSON | Execution details | Execution graph

Job history | Refresh

Google Big Query

Dashboard (Power BI):-



Interactive Dashboard for State & City-level Housing Insights”

Key Insights

- California & New York = High house price, lower affordability
- Texas & Florida = Relatively better affordability
- Mortgage rate fluctuations impact affordability differently across states

Conclusion

- Summary of findings
- Real-world implication: Policy, investment, affordability planning
- Next step: Add predictive modeling (future extension idea)

References

- Tools: BigQuery, Python (Pandas, Matplotlib), Power BI
- Dataset source

Thank You (Lets Connect):

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Git hub: https://github.com/Tanu272004

Project Link: US Mortgage Housing Analytics With Affordability Index