**Advanced Two-Sided Marketplace Analytics**

This project demonstrates a comprehensive analytics approach for a two-sided marketplace (e.g., Rover, Airbnb, Uber) using synthetic booking, owner, and sitter data. It covers end-to-end analytics: exploratory analysis, advanced segmentation, machine learning, A/B testing, and business dashboarding with Python (Jupyter) and Tableau.

**Project Objective**

* Analyze marketplace health (supply/demand, balance, trends)
* Perform operational quality assessments (response time, cancellations)
* Segment user behaviors (power users, churn, cohorts)
* Run experiments (A/B testing, feature adoption)
* Model marketplace dynamics (price elasticity, lead time)
* Evaluate trust, safety, and efficiency
* Visualize all insights in actionable dashboards

**Project Structure**

├── README.md

├── notebooks/

│ ├── 01\_data\_preparation.ipynb

│ ├── 02\_marketplace\_health.ipynb

│ ├── 03\_operational\_quality.ipynb

│ ├── 04\_segmentation\_clustering.ipynb

│ ├── 05\_ab\_testing.ipynb

│ ├── 06\_marketplace\_dynamics.ipynb

│ ├── 07\_trust\_safety.ipynb

│ ├── 08\_efficiency\_optimization.ipynb

│ ├── 09\_network\_effects.ipynb

│ └── 10\_custom\_analytics.ipynb

├── data/

│ ├── bookings.csv

│ ├── owners.csv

│ └── sitters.csv

├── tableau/

│ ├── Marketplace\_Health.twbx

│ ├── Operational\_Quality.twbx

│ ├── Segmentation.twbx

│ ├── AB\_Testing.twbx

│ └── All\_Dashboards.pdf

├── images/

│ └── dashboard\_screenshots/

├── requirements.txt

└── LICENSE

**How to Use This Project**

1. **Clone the repository**
2. **Open notebooks/** and follow each notebook step by step
3. **Explore Tableau dashboards** in tableau/ (open with Tableau Public/Desktop or view screenshots in images/)
4. **Reproduce or extend analyses** with your own data

**Tech Stack**

* Python (Pandas, Numpy, Matplotlib, Seaborn, Scikit-learn, TextBlob, Statsmodels)
* Jupyter Notebook
* Tableau (visual analytics)
* Synthetic CSV data (easily replace with real data)

**Project Steps & Documentation**

**1. Data Preparation**

* Load and clean synthetic data (owners, sitters, bookings)
* Feature engineering: response times, booking lead time, churn flags, etc.

**2. Marketplace Health & Balance**

* Sitter-to-owner ratio trends
* Listing fill rates
* Geographic supply/demand heatmaps

**3. Operational Quality**

* Sitter response time distribution
* Cancellation reasons analysis

**4. Behavioral Segmentation & Churn**

* Power user identification
* Churn prediction (ML: RandomForest)
* Cohort & lifecycle analysis

**5. Product Usage & Experimentation**

* Feature adoption tracking
* A/B Test analysis (t-tests, visualization)

**6. Marketplace Dynamics**

* Price elasticity (logistic regression)
* Time to first booking

**7. Trust & Safety**

* Incident/event rate trends
* Review sentiment analysis (TextBlob)

**8. Efficiency & Optimization**

* Idle inventory identification
* Booking lead time insights

**9. Network Effects**

* Referral impact (network analysis)
* Booking clusters (KMeans, geospatial)

**10. Out-of-the-Box Analytics**

* Dynamic pricing simulation
* Matching efficiency (request-to-confirmation)
* User journey funnel/drop-off mapping

**Tableau Dashboards**

* **Dashboards** are included as .twbx (Tableau packaged workbooks) in the tableau/ folder.
* Also included: screenshots of dashboards (images/dashboard\_screenshots/) and a PDF overview.
* Each dashboard covers a key analytics theme (Marketplace Health, Segmentation, Operational Quality, etc.).

**Reproducibility & Customization**

* All code is in clean, stepwise Jupyter notebooks.
* Replace data/ with your own or real marketplace data for direct business application.
* Tableau dashboards accept the same CSV data for plug-and-play analysis.

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**Contact**

For questions, suggestions, or collaboration, open an issue or contact [Your Name/email].