Capstone Two Project Proposal

Title: Finding the Best Neighborhood for Airbnb Investment in the Dallas–Fort Worth Area

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1. Problem Statement

The Dallas–Fort Worth (DFW) metro area is one of the fastest-growing regions in the U.S., attracting both leisure and business travelers. However, Airbnb profitability varies widely by neighborhood due to differences in demand, nightly rates, regulations, and safety.
The goal of this project is to identify the **top 3–5 neighborhoods** in DFW for the highest return on investment (ROI) for short-term rentals, using publicly available data and analytical methods.

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2. Context

Short-term rental platforms like Airbnb offer opportunities for property owners to generate income, but not all locations are equally profitable. In DFW, factors such as proximity to attractions, average daily rates (ADR), occupancy, and local laws can make or break a rental's success. By analyzing neighborhood-level data, this project will provide **data-driven guidance** for investors and hosts.

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3. Criteria for Success

- Identify neighborhoods with **high monthly revenue potential** and sustainable occupancy rates.
- Support recommendations with **quantitative metrics** (ADR, occupancy %, crime rate, walk score).
- Present results visually (maps, charts) for clarity.
- Ensure methodology is **fully reproducible** in code.

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4. Scope of Solution Space

In Scope:

- Dallas and Fort Worth neighborhoods (possible inclusion of select suburbs).
- Key metrics: ADR, occupancy, estimated monthly revenue, crime rate, walkability, housing price.

Out of Scope:

- Predicting future regulations beyond current published rules.
- Property renovation or design recommendations.

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5. Constraints

- Data availability and freshness (Inside Airbnb data updates periodically).
- Dallas short-term rental rules are under legal dispute; analysis will use current laws.
- Project completion required within **Springboard Capstone 2 timeline (approx. 4–6 weeks)**.

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6. Stakeholders

- **Primary:** Potential Airbnb investors in DFW.
- **Secondary:** Current Airbnb hosts considering expansion, property managers, real estate agents.

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7. Data Sources

- **Inside Airbnb – Dallas:** listings.csv, reviews.csv, neighbourhoods.geojson.
- **Dallas Open Data Portal:** Crime reports, zoning maps.
- **U.S. Census / American Community Survey:** Demographics, income data.
- **Walk Score API** *(optional)*: Neighborhood walkability scores.

- **Zillow / Realtor API** *(optional)*: Median home prices.

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8. Proposed Approach

1. **Data Acquisition & Cleaning:** Load Inside Airbnb data, merge with crime and housing datasets.
2. **Feature Engineering:** Calculate revenue/month, normalize occupancy for seasonality, integrate walkability and crime scores.
3. **EDA:** Explore trends between location, pricing, occupancy, and other factors.
4. **Modeling (optional):** Regression for revenue prediction, clustering for neighborhood grouping.
5. **Visualization:** Interactive map highlighting top neighborhoods.
6. **Recommendations:** Rank neighborhoods with justification.

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9. Deliverables

- GitHub repository with:
    - All datasets (or acquisition instructions)
    - Jupyter notebooks with cleaning, analysis, visualizations
    - `requirements.txt` file
- Final **PDF report** (converted from Google Doc)
- **Slide deck** summarizing findings
- Optional: Interactive web map

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10. SMART Alignment

- **Specific:** Targets DFW Airbnb profitability at the neighborhood level.

- **Measurable:** Revenue, occupancy, ADR, rankings.
- **Action-oriented:** Produces clear recommendations for investors/hosts.
- **Relevant:** Addresses a real business decision problem in a growing market.
- **Time-bound:** Completion within Capstone 2's 4–6 week schedule.