Student Demand–Focused Real Estate Market Analysis

1. Project Motivation and Research Focus

Housing markets located near universities differ structurally from standard residential markets. Students represent a **distinct demand group** characterized by short-term rental behavior, high mobility, and limited purchasing power. Despite their importance, student demand is often implicitly assumed rather than explicitly modeled.

The core motivation of this project is to **explicitly model student demand within a relational database** and to analyze how student presence affects rental prices, sales prices, amortization periods, and investment attractiveness across regions.

2. Establishment of the Database Environment

The first applied step of the project was the creation of a dedicated database environment in MySQL. A new database was created and named in a way that reflects the thematic scope of the study. After creation, the database was selected as the active working environment using the USE command.

Creating a separate database ensured that:

- all operations were isolated from other projects,
- the schema could be dropped and recreated without side effects,
- the entire analysis could be reproduced from scratch.

3. Schema Design and Table Creation

A After activating the database, the database schema was implemented step by step using CREATE TABLE statements. Tables were created in a specific order to respect foreign key dependencies.

3.1 Region Table

The region table was created first because it represents the **central entity** of the database. All other tables reference regions either directly or indirectly.
This table stores regional-level characteristics such as:

- infrastructure quality,
- transportation access,
- housing supply status,

- average building age,
- indicators related to student contribution.

An auto-incremented primary key was defined to uniquely identify each region.

3.2 Property Type Table

The property_type table was created next to capture the physical and structural characteristics of housing units. Each property is linked to a region using a foreign key.
This table includes:

- room configuration,
- size in square meters,
- building type,
- furnishing status,
- structural indicators such as elevator availability and insulation quality,
- risk classification of the building.

This separation allows housing characteristics to be analyzed independently from pricing data.

3.3 Price Information Table

The price_info table was created to store economic indicators related to each property. This includes rental prices, sales prices, price per square meter, and amortization (payback) periods.
By separating price data into its own table:

- temporal analysis becomes possible,
- pricing logic remains independent of physical characteristics,
- investment-related metrics can be calculated dynamically.

3.4 Demand Structure Table

The demand_structure table explicitly models different demand groups within each region. This table is critical for the project's student-focused perspective.
It stores:

- student demand share,
- shares of other demand groups (civil servants, tradesmen, singles),
- qualitative notes summarizing overall demand characteristics.

This table operationalizes the concept of **student demand as a measurable variable**.

3.5 Demographics Table

The demographics table was created to capture population-level indicators that support demand analysis.
It includes:

- student population counts,
- household counts,
- demographic ratios relevant to housing demand intensity.

These values allow student density to be calculated and compared across regions.

3.6 Market Note Table

Finally, the market_note table was created to store qualitative observations derived from field notes and interviews. This ensures that the database integrates both quantitative and qualitative information.

4. Data Insertion

After all tables were created, data were inserted using INSERT INTO statements. The inserted data are **synthetic but realistic**, designed to reflect plausible differences between student-dominated and non-student-dominated regions.

Data insertion was performed table by table:

1. Regions were inserted first.
2. Property types were inserted and linked to regions.
3. Price information was inserted for each property.
4. Demand structure and demographic data were added last.

This sequence ensured referential integrity and prevented foreign key violations.

5. Analytical SQL Queries

After populating the database, a series of analytical SQL queries were executed. Each query was written to address a specific research objective.

5.1 Region-Level Summary Analysis

The first analytical query calculated average rent, sale price, and amortization period per region and linked these values to student demand ratios.

This query provided a baseline comparison across regions and revealed that regions with higher student demand often exhibit shorter amortization periods, even when rental prices are not the highest.

5.2 High Student Demand and Rental Prices

The second query filtered regions with high student demand and calculated average rent per square meter.

The purpose of this query was to test whether student presence directly inflates rents. The results showed that student-heavy regions do not uniformly exhibit higher rents per square meter, suggesting that student demand affects markets through stability rather than price escalation.

5.3 Low Amortization and Risk-Oriented Analysis

Another query focused on identifying properties with low amortization periods while considering building risk classifications.

This analysis demonstrated that student demand can compensate for higher structural risk by ensuring continuous occupancy, making certain higher-risk properties economically viable investments.

5.4 Investment Scoring Using CTEs

A multi-criteria investment scoring query was implemented using Common Table Expressions (CTEs) and CASE logic.

- This query combined:
- amortization period,
- student demand ratio,
- student density,
- housing supply conditions.

The result was a ranked list of regions based on overall investment attractiveness, highlighting the reinforcing role of student demand when combined with favorable supply conditions.

5.5 Student Rent Premium Estimation

A comparative query was written to estimate the rental premium attributable to student demand by benchmarking against regions with minimal student presence.

The results indicated that a student-related rent premium exists but remains moderate, supporting the conclusion that students enhance market continuity rather than speculative price growth.

5.6 Risk Category Comparison

The final query grouped properties into risk categories and compared pricing and amortization metrics.

This analysis showed that student demand mitigates investment risk by reducing vacancy-related uncertainty.

6. Results and Interpretation

The integrated analysis leads to several conclusions:

- Student demand does not uniformly increase rents.
- Student presence significantly shortens amortization periods.
- Student-driven markets exhibit higher rental continuity.
- Investment attractiveness is driven by stability rather than price maximization.

Explicitly modeling student demand improves both analytical clarity and explanatory power.

7. Role of AI Assistance

ChatGPT was used strictly as a technical assistant. All analytical decisions and interpretations belong to the author.

8. Conclusion

Explicitly modeling student demand improves the analytical depth of real estate market analysis and highlights students as a stabilizing demand group.