## **DataFest – Predicting Commercial Rent Prices**

RStudio Wizards: Nathan Bressette, Mathew Wolz, Khushnudbek Usmonov, Jossua Chartier April 5, 2025

*Research Question*: Can we accurately classify overall rent as underpriced or overpriced to support Savills and renters, and what are the most influential variables contributing to this classification?

*Objective:* This project analyzed commercial real estate's overall rent, using key metrics such as overall rent prices, occupancy rates, and market conditions to predict whether a lease was considered overpriced or underpriced. The goal was to develop models that could accurately classify rent prices as underpriced or overpriced, offering actionable insights for real estate professionals, like Savills, and supporting renters in making more informed decisions.

**Data Cleaning**: Initial cleaning involved grouping all relevant variables, followed by the use of Support Vector Machine and XGBoost, but we decided to go with a Random Forest because of the highest  $R^2$  (0.98) to predict overall rent. A new binary variable, Price Category, was then created, where the model returned 1 if the overall rent was greater than the predicted value and 0 otherwise. This classification helped to identify whether rents were underpriced or overpriced.

*Findings:* From Figure one, we found that the most important variables when predicting overall rent were market, year, RBA (Rentable Building Area), zip code, CBD\_surburban, and availability\_proportion, among others. Figure two indicates that Dallas/Fort Worth, Texas, had the highest proportion of overpriced rent in the United States in 2024, though each market's classification as underpriced or overpriced varies from year to year.

*Takeaways:* The market is gradually recovering from the COVID-19 pandemic, and our research indicates that its conditions are significantly affected by the year. When advising a company on purchasing a property, Savills should take into account factors such as location, RBA, availability, and other pertinent considerations.

