

HPA Data Assessment

1 About the Data

For every tenant, whenever their lease is about to expire, a renewal notice is sent 60-90 days before the expiration date. The notice also indicates whether their rent is going to increase or not in their next term. The resident can then decide to either renew the lease or move-out (i.e., not renew).

The underlying dataset in this assessment shows whether an existing lease on a home was renewed or not. Each row in the data represents a lease on a home, its characteristics, and whether the resident renewed the lease for the next term. Below is the description of each column in the dataset. The data in all columns is binary 0 or 1 (except the lease ID).

Column	Description
lease_id	Unique ID for each lease
no_rent_change	The lease rent was not changed for the next term
rent_change_10	The lease rent was increased by 10% for the next term
rent_change_20	The lease rent was increased by 20% for the next term
lease_length_1	This is resident's first term on the lease
lease_length_2	This is resident's second term (they've renewed once before)
lease_length_3	This is resident's third term (they've renewed twice before)
age_range	Set of columns indicating average age of residents in the household
NoFinesViolations	Indicates the resident had no fines or violation on the lease
PositiveSurvey	Indicates the resident provided a positive feedback on the survey
LatePayments	Indicates the resident has never been late on making payments
HOA_mandatory	Indicates whether there's a mandatory HOA fee on the lease
Renewed	Indicates whether the resident renewed the lease or not

2 Instructions

- Please answer the questions in the section below

- Please include your code and thought process used to navigate the questions below. Code is required for this exercise, and Python scripting language (or Jupyter Notebook) is preferable for solutions. Please include your detailed thought process and analysis either as a part of the Jupyter Notebook, or as a separate document which duly references the code
- Clear, concise, and thorough answers are appreciated. While you can include technical jargon in your analysis, please include plain text conclusions and insights as well.
- Feel free to include charts or tables, but please provide context around all analysis

3 Questions

Important Note: Please do not build any kind of regression or classification model to address the questions below

Question 1: What are the key drivers that explain whether a resident will renew the lease or not? In other words, what are the renewal promoters and detractors?

Question 2: Are these promoters and detractors statistically significant or not? How do you prove that?

Question 3: When you present this analysis to the leasing business, what are the key conclusion and action items you'll propose to the team?

Question 4: What additional data would you ask the business for in order to help you further refine analysis for questions 1 and 2?