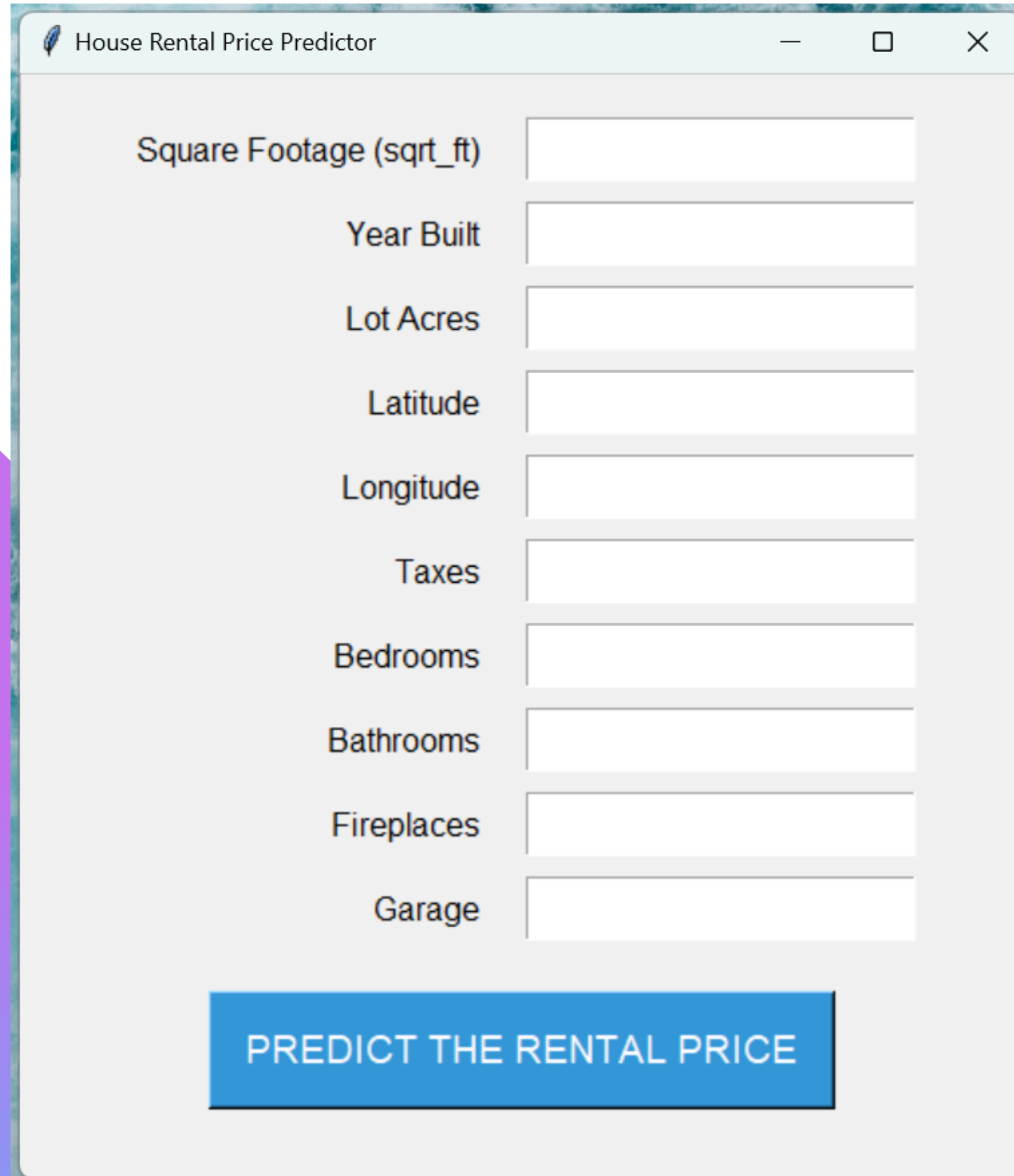


RENTAL HOUSE PRICE SIMULATOR

ABAROUDI Younes

09/09/2024



The screenshot shows a web browser window titled "House Rental Price Predictor". The interface is a light gray form with several input fields for property details. The fields are arranged vertically on the left side of the form, each with a label and a corresponding text input box on the right. The labels are: "Square Footage (sqrt_ft)", "Year Built", "Lot Acres", "Latitude", "Longitude", "Taxes", "Bedrooms", "Bathrooms", "Fireplaces", and "Garage". At the bottom of the form, there is a large blue button with the text "PREDICT THE RENTAL PRICE" in white capital letters.

Square Footage (sqrt_ft)	<input type="text"/>
Year Built	<input type="text"/>
Lot Acres	<input type="text"/>
Latitude	<input type="text"/>
Longitude	<input type="text"/>
Taxes	<input type="text"/>
Bedrooms	<input type="text"/>
Bathrooms	<input type="text"/>
Fireplaces	<input type="text"/>
Garage	<input type="text"/>

PREDICT THE RENTAL PRICE

About the project

The goal of the Rent Value Estimator is to provide homeowners, real estate investors, and rental management companies with an estimation of the monthly rental income a property could generate, based on a percentage of the property's value (here assumed to be 0.4% of the house's sale value as defined in the Class with the GenG Team). This estimator helps answer critical business questions such as:

- Should I rent or sell my property?
- How much monthly rental income can I expect from my house?
- Is it worth managing this property for rental income?



SUMMARY

01

EDA and Feature
Engineering

02

Model Evaluation

03

Demo for the application

04

Summary

EDA and Feature Engineering



year_sqrt

- Created by multiplying the house's year built with square footage to capture interaction effects between them



inverse_house_age

- Created to capture potential non-linear relationships between house age and its effect on rental or sale



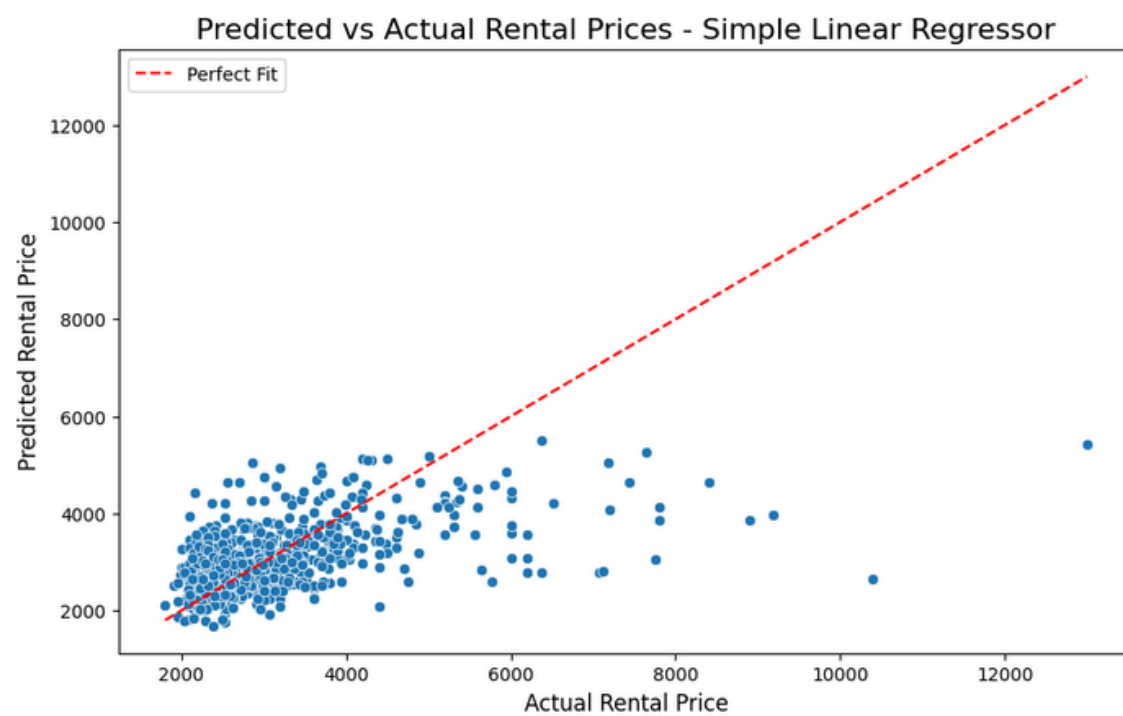
Features Selection and scaling

- 12 features selected
- 10 features scaled using the MinMax method



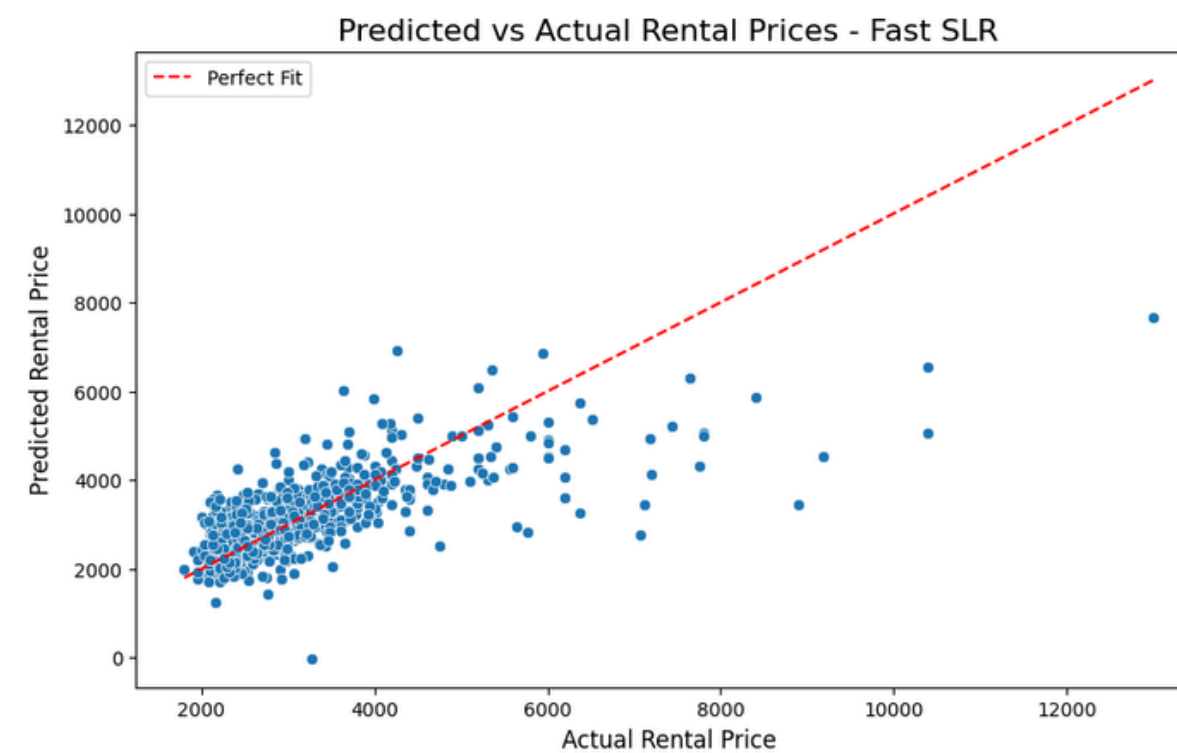
Model Evaluation (1/2)

SIMPLE LINEAR REGRESSION



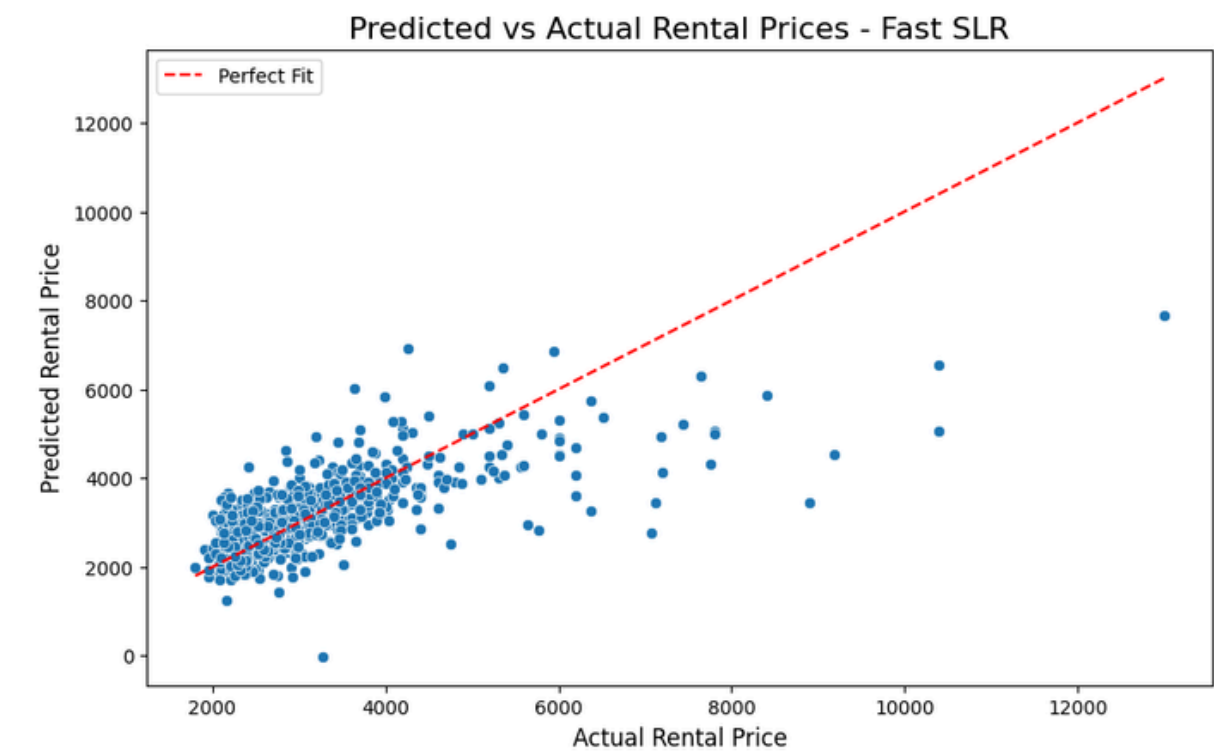
OLS: 456962.3588, R-squared: 0.2669, MAPE: 18.3741

FAST SIMPLE LINEAR REGRESSION



OLS: 304170.8158, R-squared: 0.512, MAPE: 15.6461

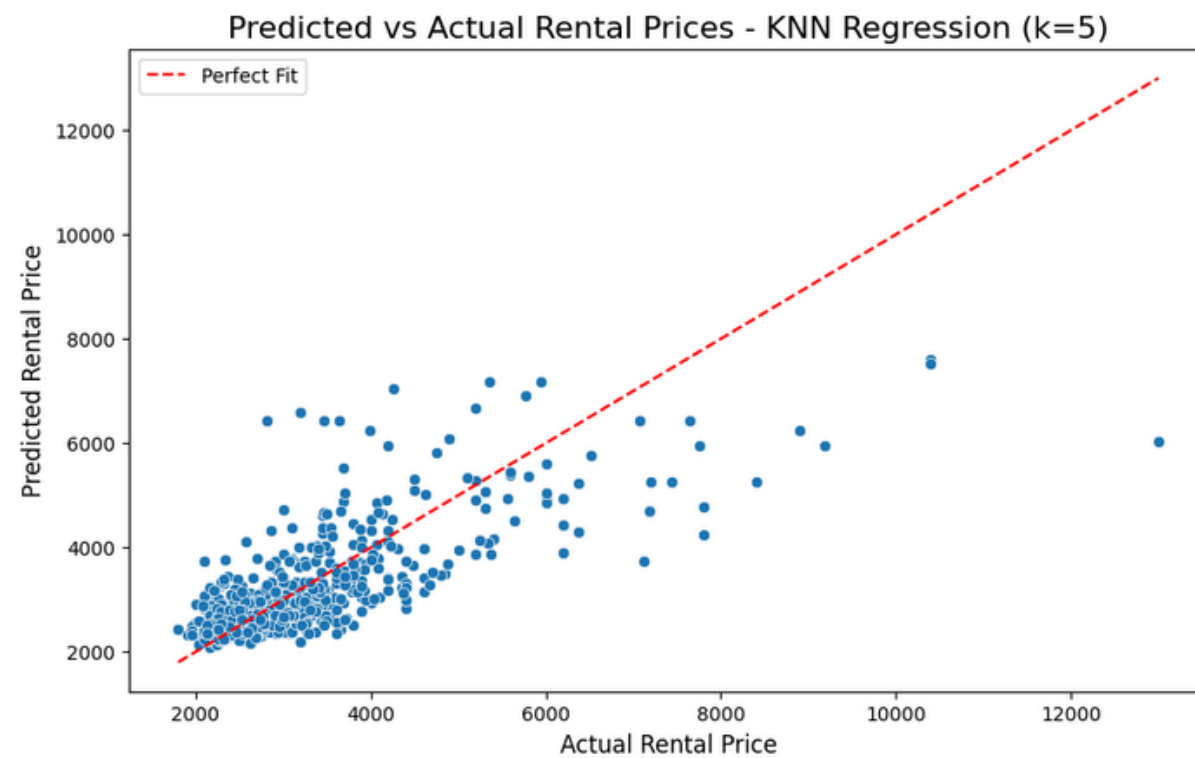
MULTI VARIATE LINEAR REGRESSOR



OLS: 306540.3406, R-SQUARED: 0.5082, MAPE: 15.1413

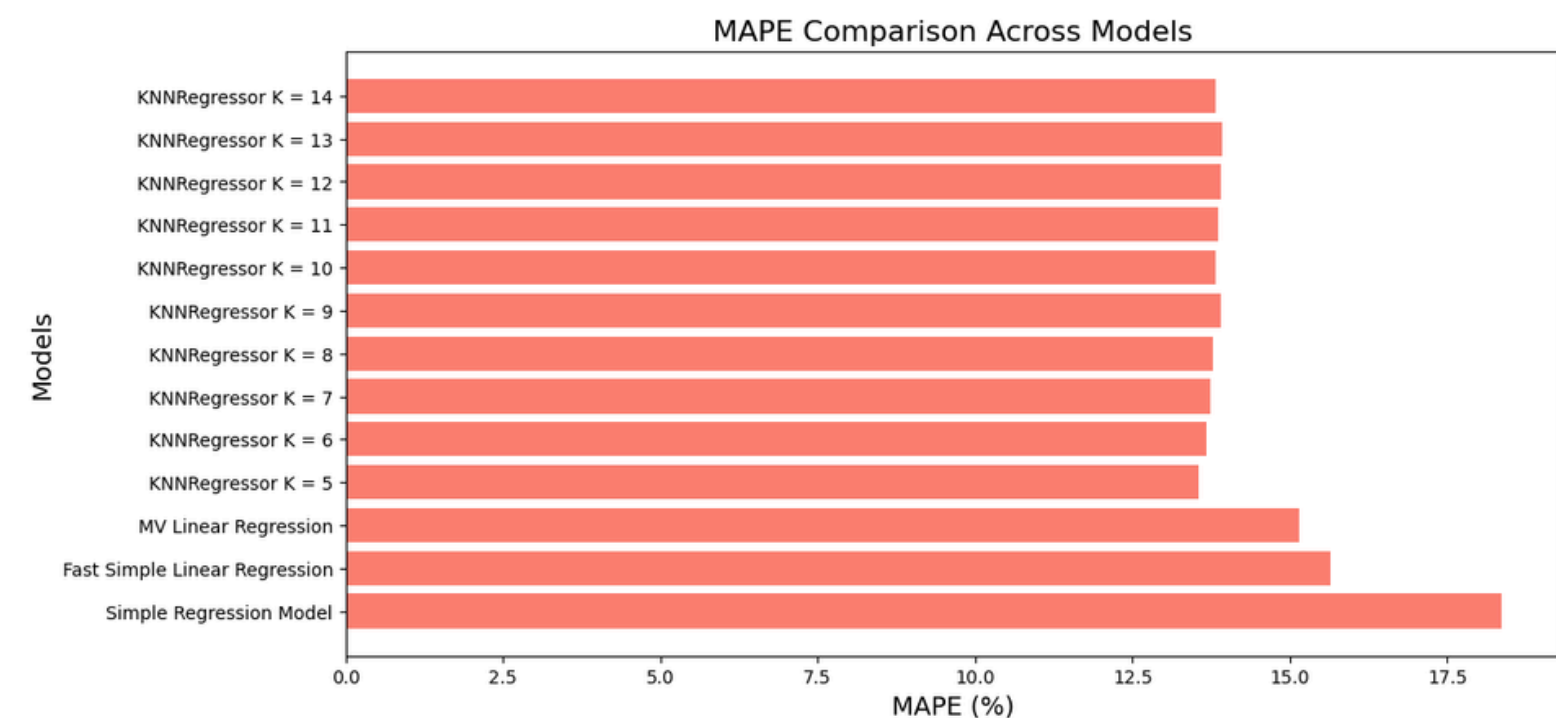
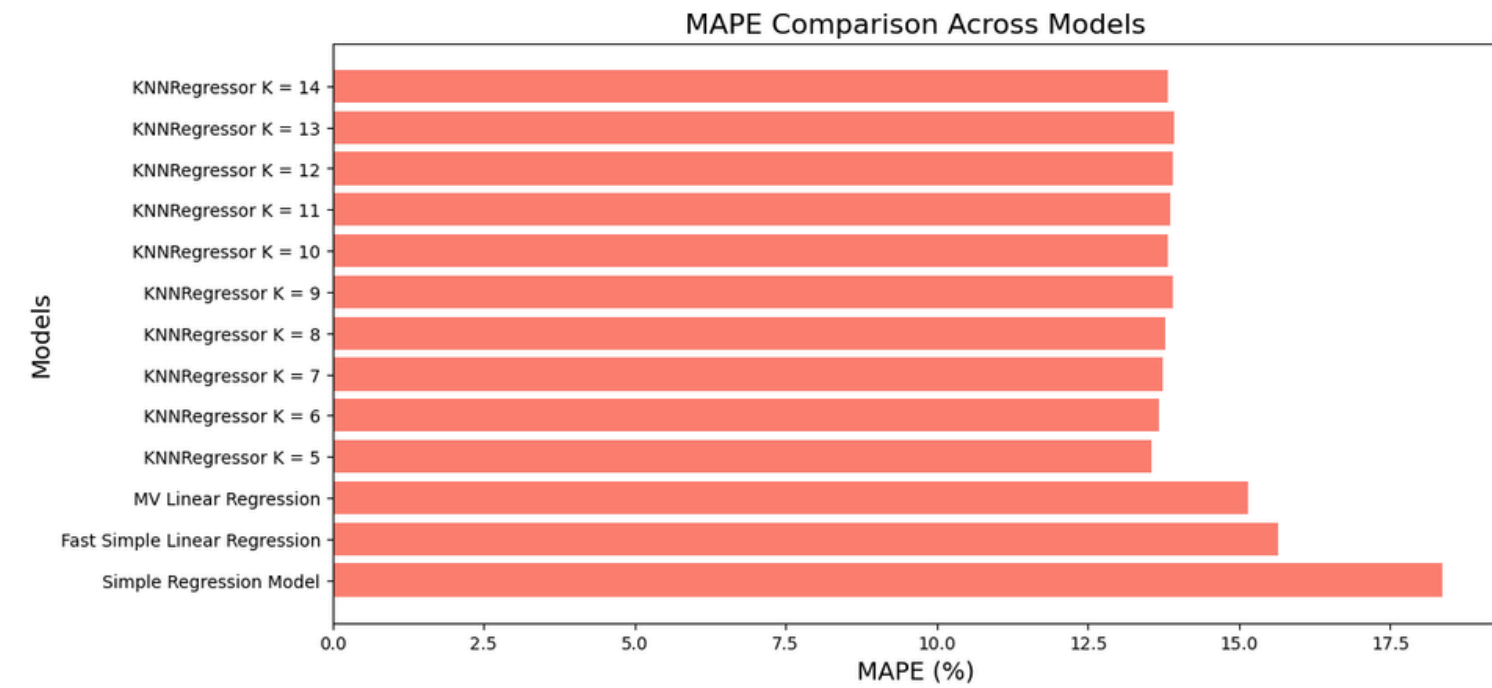
Model Evaluation (2/2)

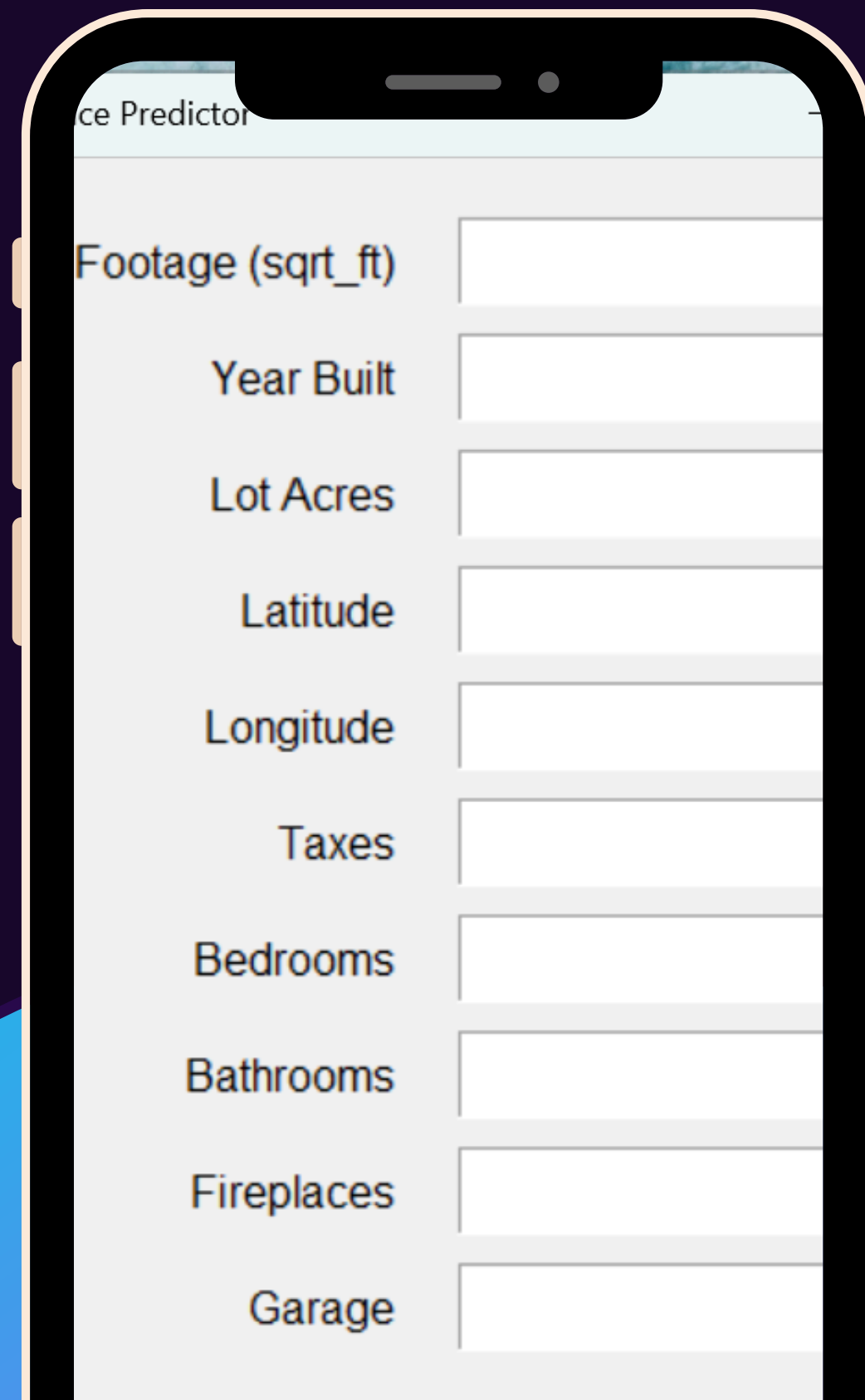
KNN REGRESSOR



KNN Regressor with $K = 5$ shows the best performance:

- R-squared = 0.5987
- MAPE: 13.548
- OLS: 250140.3955
- We chosed this model for our application as it has better accuracy and less errors.





ce Predictor

Footage (sqft)	<input type="text"/>
Year Built	<input type="text"/>
Lot Acres	<input type="text"/>
Latitude	<input type="text"/>
Longitude	<input type="text"/>
Taxes	<input type="text"/>
Bedrooms	<input type="text"/>
Bathrooms	<input type="text"/>
Fireplaces	<input type="text"/>
Garage	<input type="text"/>

Demo for the Rental House Simulator

- **Tools**

Tkinter
Python
Numpy
Pandas

- **Why choose our app ?**

- Maximize Your Property's Value
- Make Informed Decisions
- Get Instant Results

SUMMARY

The app implements a KNN regression model to predict rental prices based on historical data, offering practical insights for property investors.



01

Key Metrics

- KNN of $K=5$ has $R\text{-squared} = 0.5987$, $\text{MAPE} = 13.55\%$.
- Outperforms the Simple Regression ($R\text{-squared} = 0.2669$) and Multiple Variable Linear Regression ($R\text{-squared} = 0.5082$).

02

Optimal Solution

KNN Regressor with $K = 5$ has the best performance

03

User-friendly interface

Easy-to-use tool for real estate investors to get fast, accurate price estimates.

**RENTAL HOUSE PRICE
SIMULATOR**

**THANK
YOU**