Building a rental price barometer for Madrid using Idealista
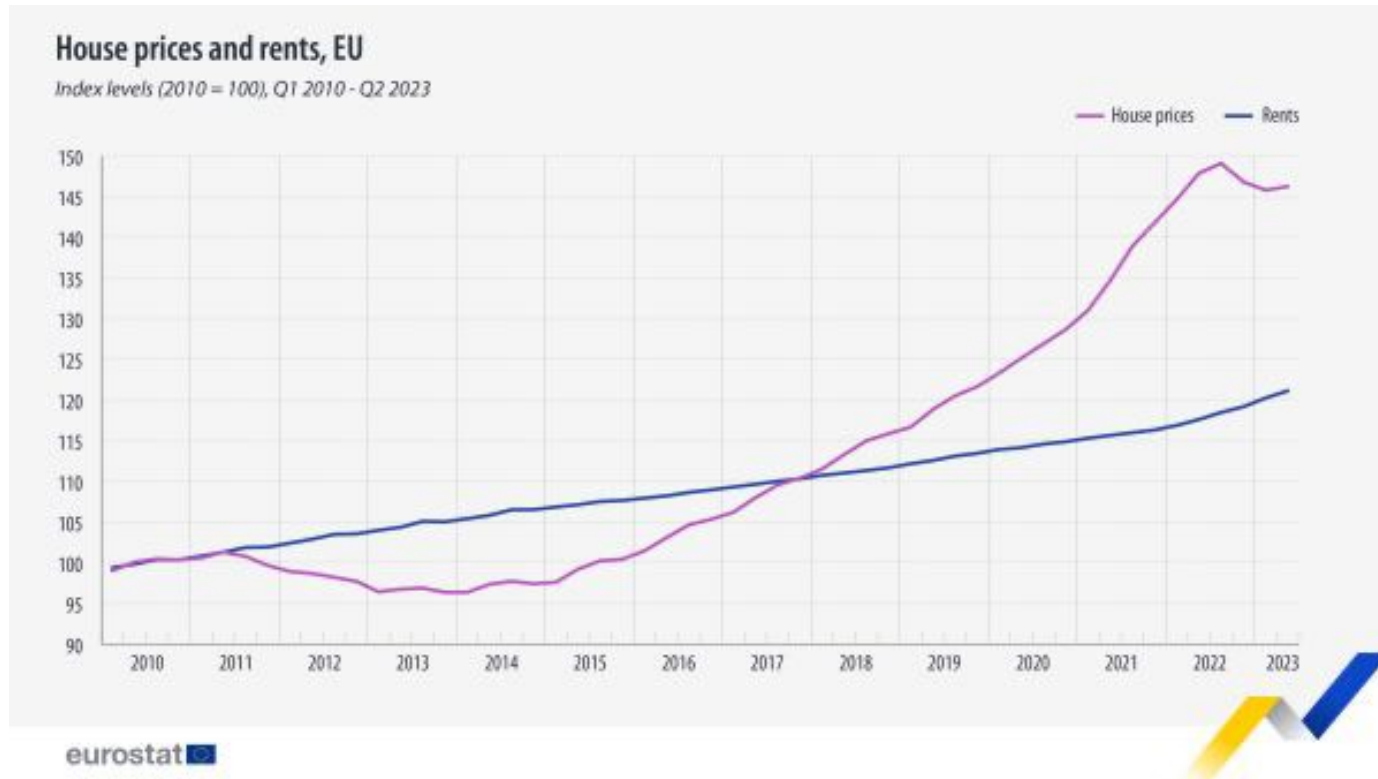
December 2023
Antonio Montilla
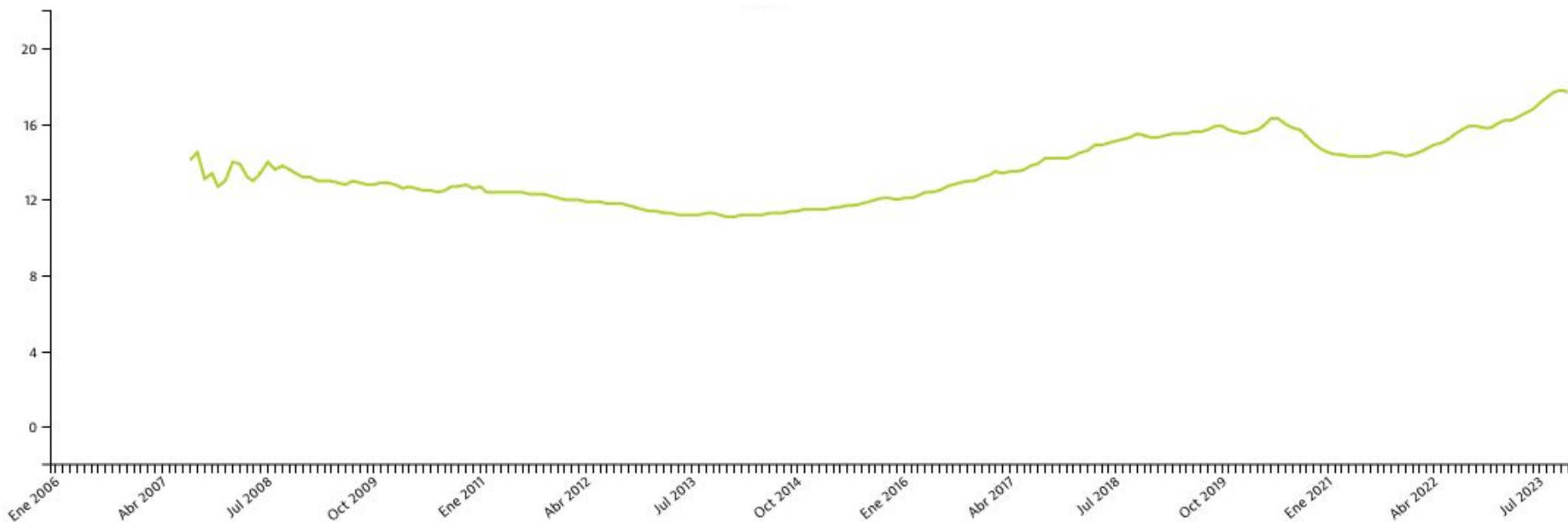
Rental price barometer: motivation

House prices and rents, EU
Index levels (2010 = 100), Q1 2010 - Q2 2023

Rental price barometer: motivation

Average rental price in Madrid (euros per m2)

Source: Idealista.com

Rental price barometer: Idealista portal

Rental price barometer: Idealista portal

Long-term rentals in Madrid, Spain: 6,872 houses and flats

Buy **Rent** Share

☰ List   📍 Map

New listings by email

🔔 Save search

Sort by: Relevance | Lowest price | Most recent | More ▾
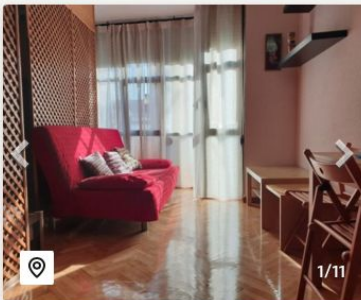
Filters

Property type
Homes ▾

Price
Min ▾   Max ▾

Size
Min ▾   Max ▾

Flat in calle Chisperos, Los Cármenes, Madrid

600 €/month

1 bed. 40 m² 1st floor exterior without lift 4 minutes

GENERAL RICARDOS PROTECTED RENTAL, Rent Furnished studio with a bedroom separated by a screen giving a little more privacy, double bed 1.40 closet, furnish...

📞 View phone number 🖂 Contact

Penthouse in Tesoro, Malasaña-Universidad, Madrid

850 €/month 990 € ↓14%

1 bed. 65 m² 4th floor interior with lift 12 Dec

*****************HOME TEMPORARY RENTAL AVAILABLE NOW************************* ** ********************MONTHLY STAY...

Rental price barometer: project objectives

Introducing the rental price barometer

(1)   A prediction range of rental prices

(2)   Actual statistics of rental prices from listed properties

(3)   Up to five listings that match the search criteria

(4)   An option to retrieve socio-economic data for the enquired district

Price rental barometer: Steps
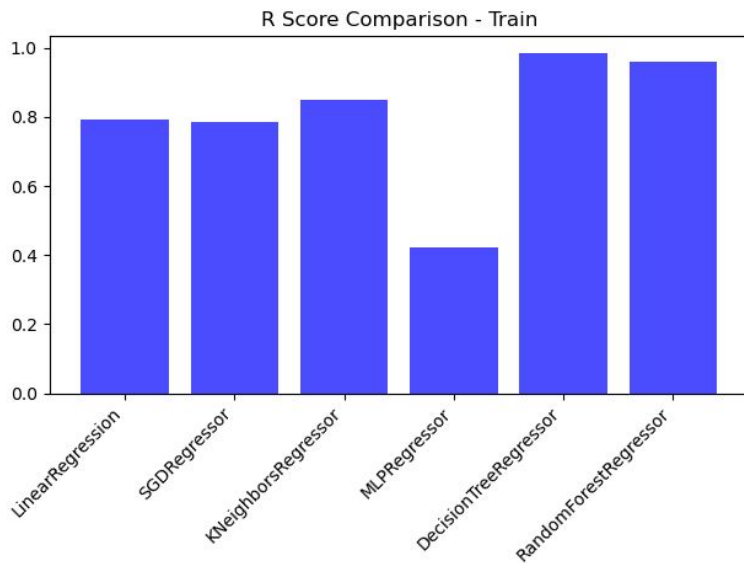
Rental price barometer: Data extraction
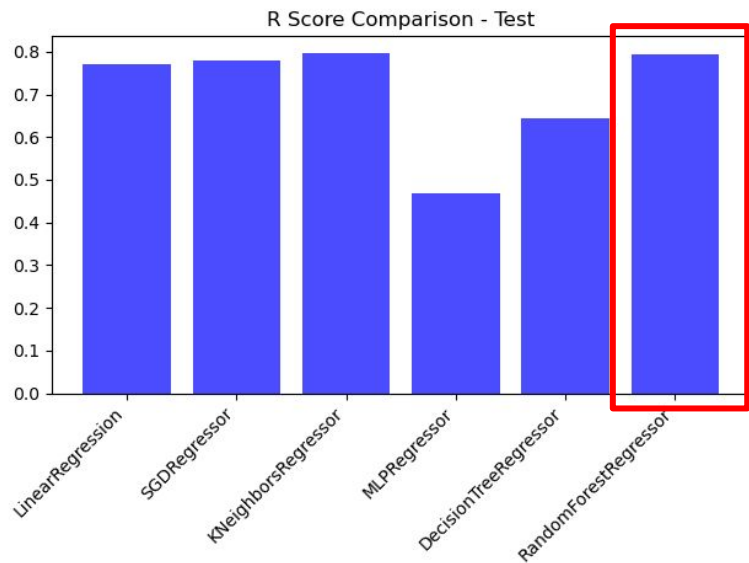
➜ Idealista API: API-key restrictions

➜ Total data extraction: 4,500 rows rental properties listed in Madrid.
◆ About 70% of the total

➜ 40 features:
◆ Monthly rental price
◆ Description
◆ Location
◆ Number of rooms
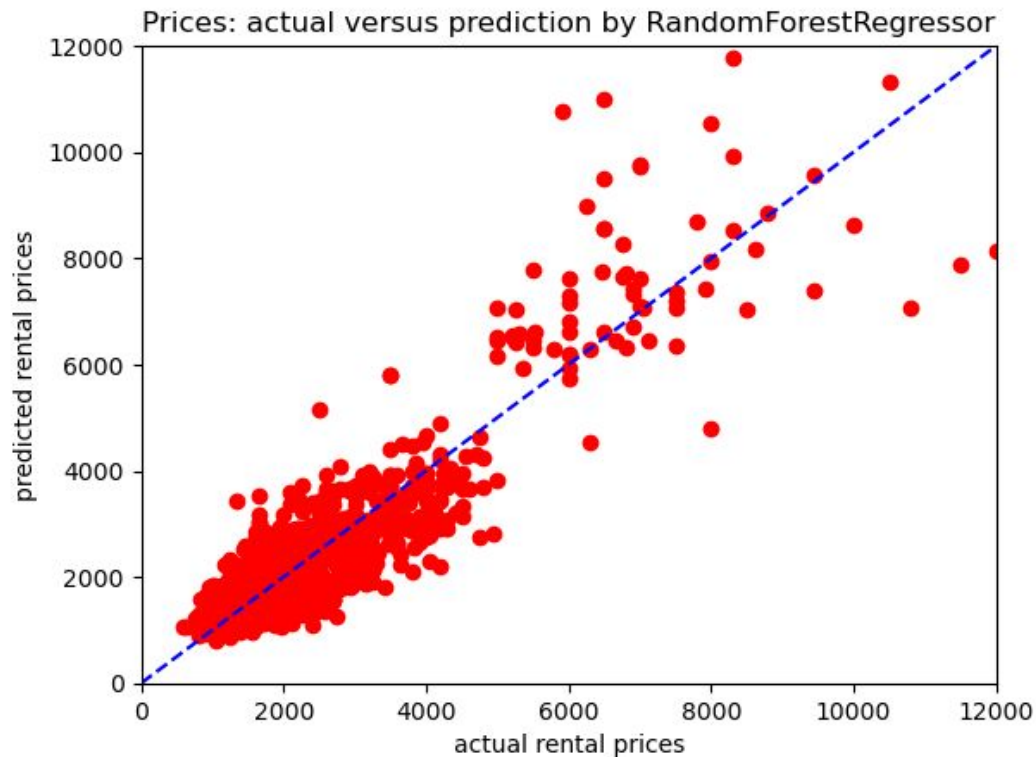◆ …

Rental price barometer: EDA & Modelling

➔ Data cleaning, Exploratory Data Analysis and Transformations
➔ Final dataset:
  ◆ Price (target variable)
  ◆ 8 main features:
    ● Size
    ● Rooms
    ● Bathrooms
    ● Parking
    ● Terrace
    ● Lift
    ● District
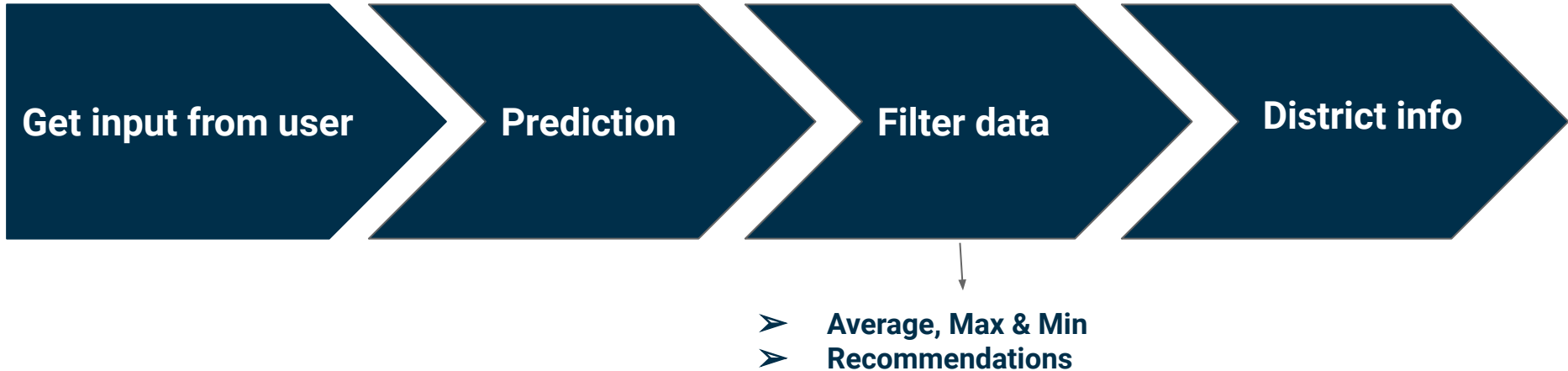   ● Luxury

Rental price barometer: EDA & Modelling

- Construct ML regression models to see effect of X variables in explaining prices
- Data wrangling, data transformations, X-Y split, etc...
- ...testing different models:

RandomForestRegressor: Y_pred versus Y_test

Prices: actual versus prediction by RandomForestRegressor

Rental price barometer: Model deployment

Get input from user → **Prediction** → **Filter data** → **District info**

➢ **Average, Max & Min**
➢ **Recommendations**

Rental price barometer: A demonstration

…Let's show in Python with Jupyter…

Final thoughts, caveats and further analysis

- **Overall,** the rental price barometer is a valuable tool:
    - High accuracy prediction model.
    - Information on actual properties.
    - …and on desired district.

- But there are **significant limitations** and room for improvement:
    - Model training data… 11 December 2023.
    - No Real-time recommendations.
    - UX design.

- However, the barometer is a **potential prototype** that could be presented for further development.