DATA MANAGEMENT - ECON2306-1

INSIDE AIRBNB

PARIS

Rachelle DAOUDI
Larissa DUTRA
Edom SILESHI

Why this topic ?

- For **ERASMUS Students** who would like to visit Paris while they are still in Europe/close to France

- **Save money** on accommodation to do other activities in the city

The question we tried to answer :

Where to find the cheapest accommodation in Paris?

Data cleaning [Standard]

Removal of specific columns: irrelevant or not necessary for the analysis (host, URL,...)

Deleting rows with missing values: from 'review_scores_rating' and 'review_scores_accuracy'

Price transformation: from text to floating point number

Creation of new variables: 'price_per_person'

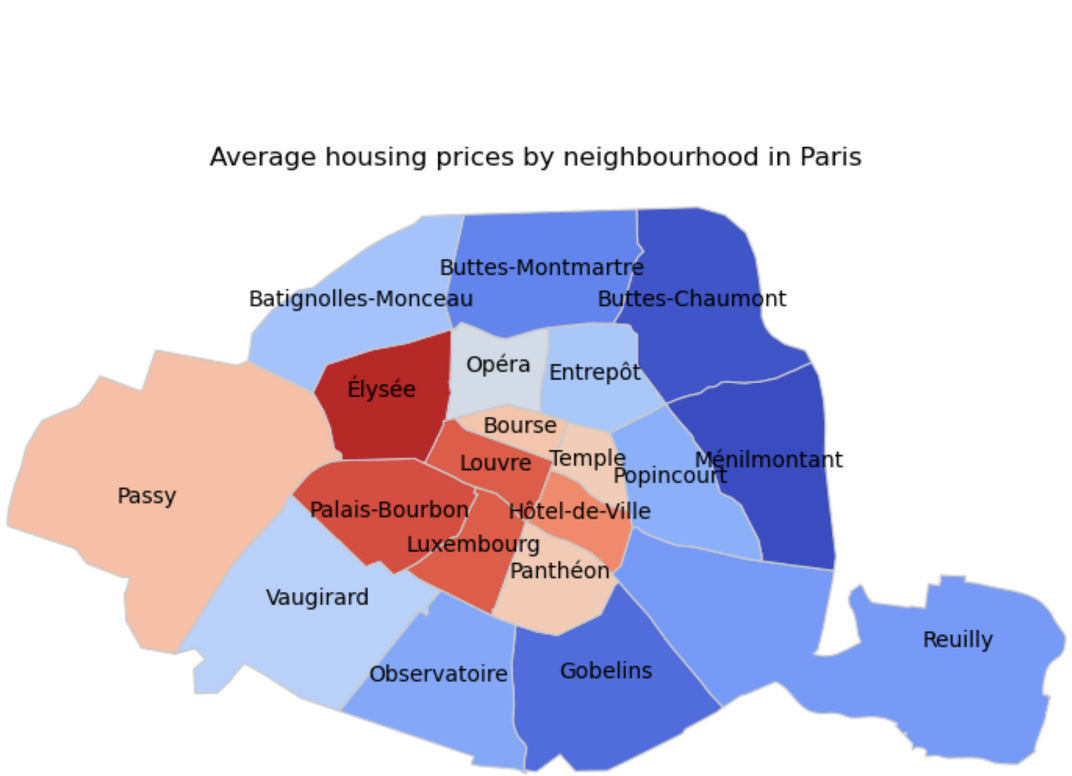
Adjustment of latitude and longitude values: rounded to 7 decimal places for greater accuracy.

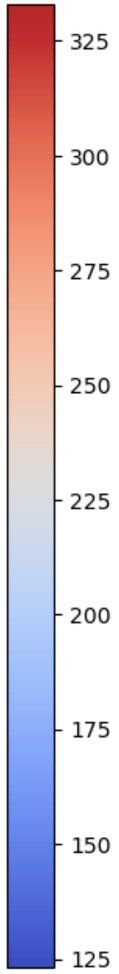
Removal of outliers: price greater than 7000 are considered outliers and are removed.

Filtering based on the "minimum_nights" and "availability_365" conditions:
Lines where "minimum_nights" is greater than 15 are removed and lines where "availability_365" is less than 10.

Changes to the precision of 'review_scores_rating':
The code then rounds 'review_scores_rating' to two decimal places.

Data Visualisation [Advanced]





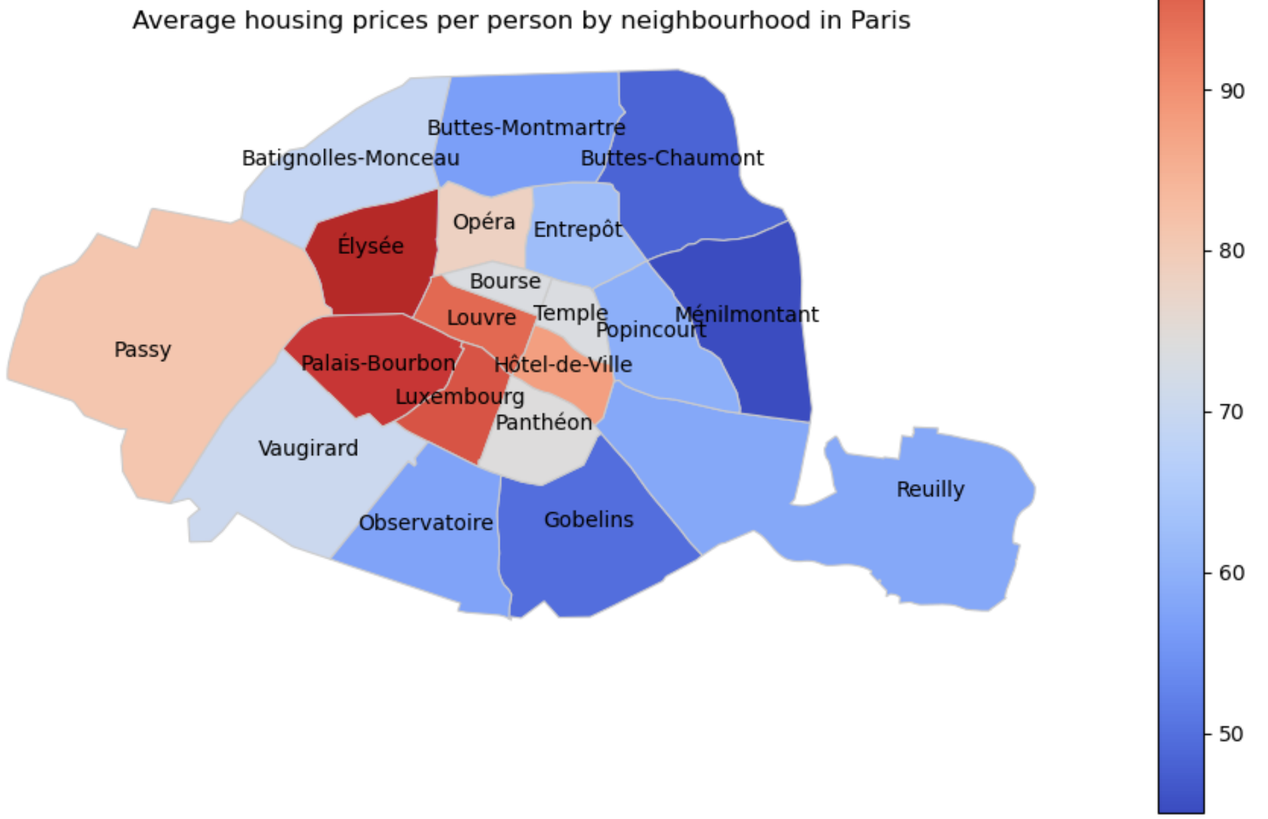
N°1 : Heatmap
Average housing prices by neighbourhood in Paris

- Most expensive : center of Paris (especially Elysée)
- Lowest average price : north-est of Paris

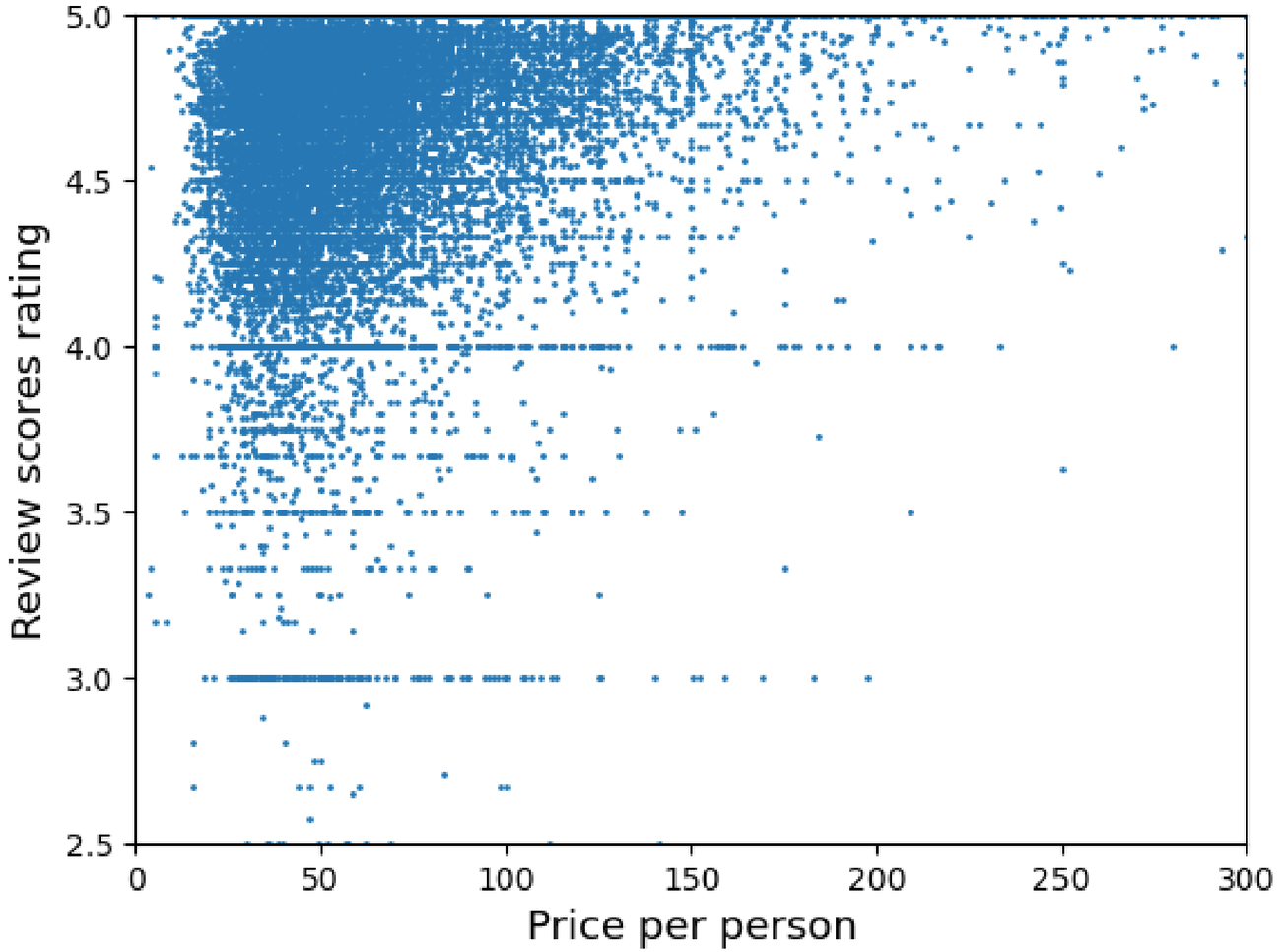
Data Visualisation [Advanced]

N°2 : Heatmap
Average housing prices per person by neighbourhood

- No major difference between prices per person and price by neighbourhood



Data Visualisation [Advanced]



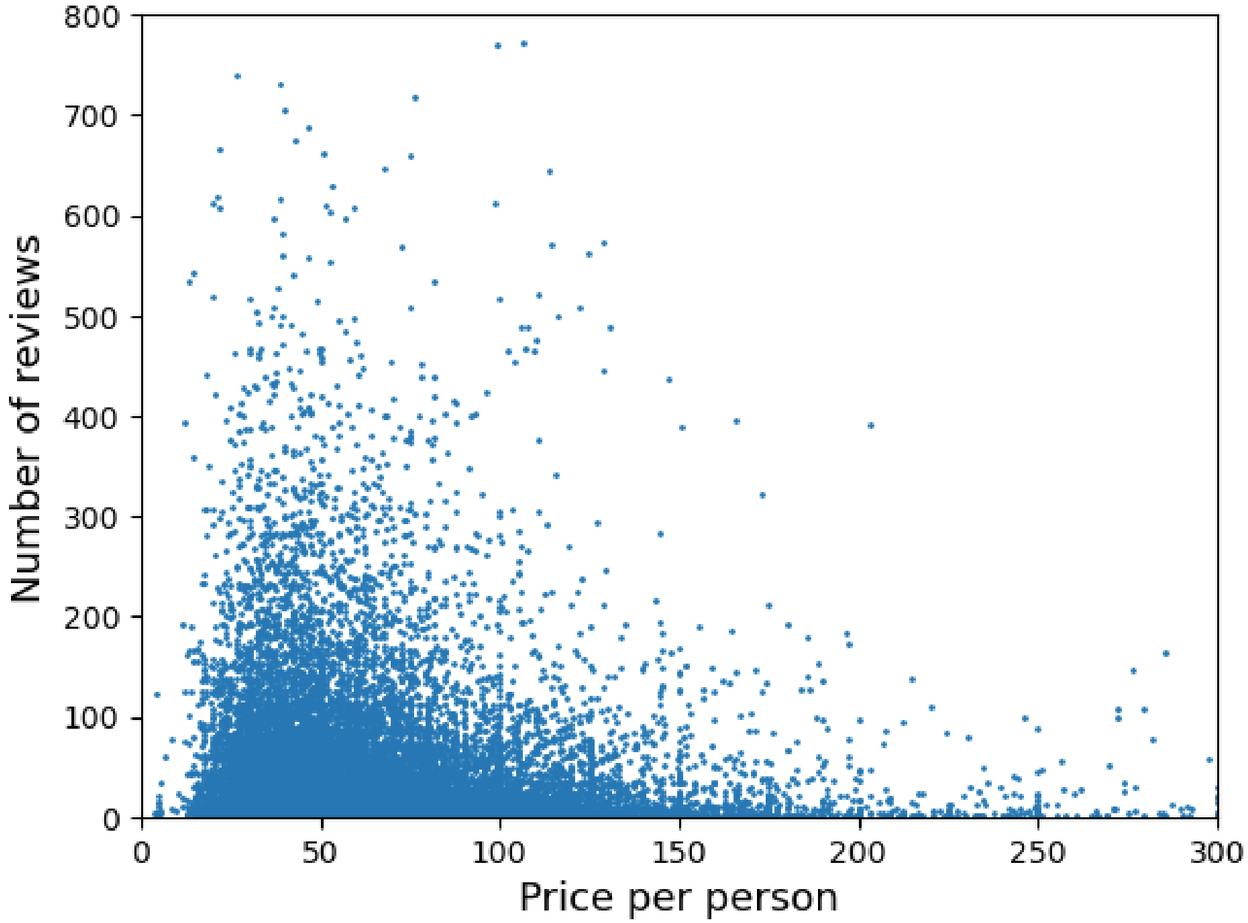
N°3 : Graph
Correlation between "price_per_person" and "review_scores_rating"

- Positive logarithmic correlation between price_per_person and review_scores_rating

Data Visualisation [Advanced]

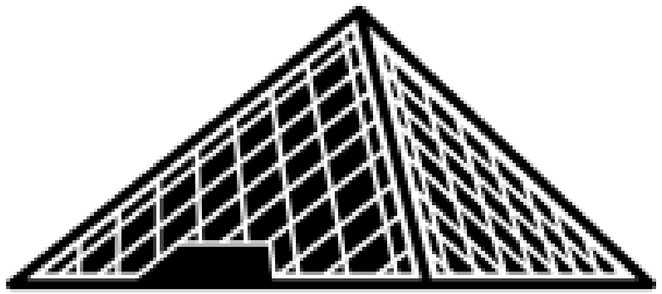
N°3 : Graph
Correlation between "price_per_person" and "number_of_reviews"

- Negative exponential correlation between price_per_person and number_of_reviews



Data Visualisation [Advanced]

Where to rent the cheapest AirBnB accommodation closest to the Louvre ?



- As close as possible to the museum and the least expensive : **Bourse**.
- A bit further and a bit more expensive : **Panthéon** OR **Temple.**

Data Modelling [Standard]

Model to predict price in relation to the distance to the Louvre

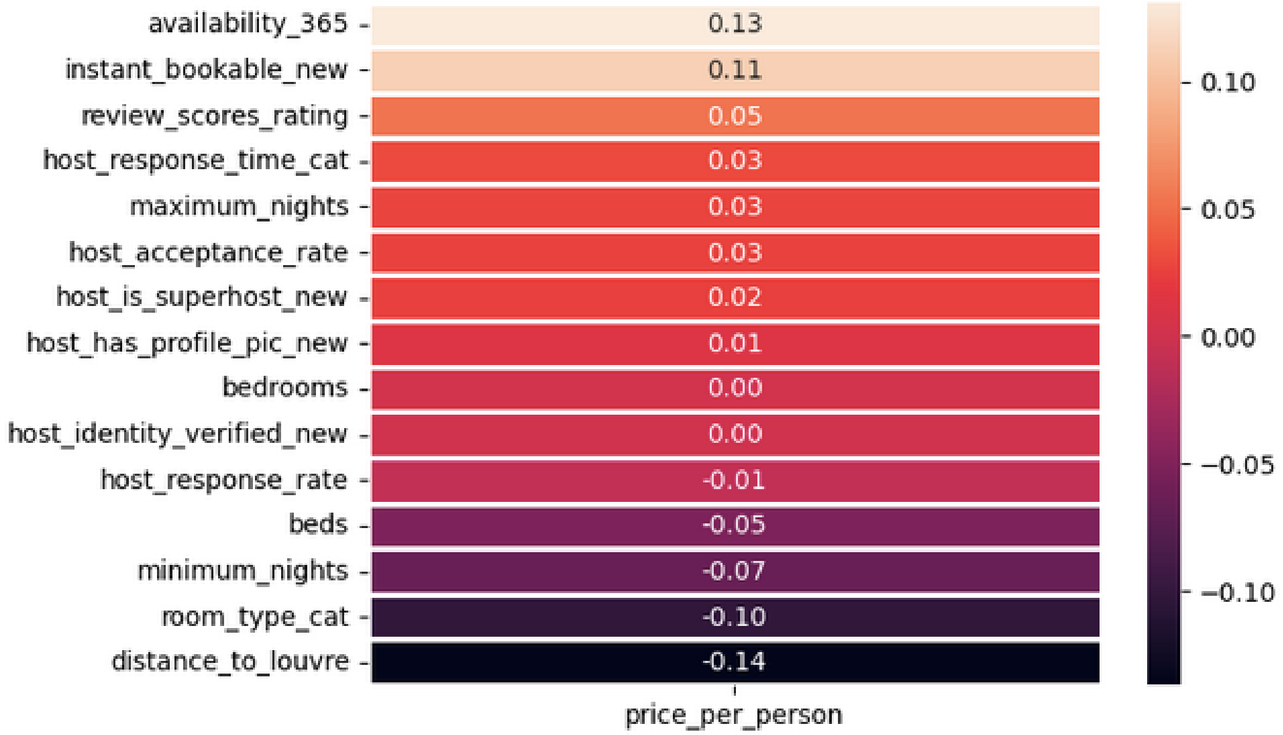
RMSE:241.79720658191408

RMSE (Root Mean Square Error) : differences between the values predicted by a model and the actual values. **This RMSE means the predicted Airbnb prices differ from the actual prices by about €241.79, on average.**

It is a **high error**, which means that using only the distance to the Louvre to predict the price of an Airbnb is not accurate and we should use other factors that are influencing accomodations' price.

Data Modelling [Standard]

The matrix to choose the best variables to be used for the model



- The higher the price, the closer the accomodation is to the Louvre.
- Accomodations that are available for more days in a year might be more expensive.
- The other variables have a weaker correlation with price (they do not significantly influence the price of AirBnB accommodation).

Data Modelling [Standard]

3 models to predict price in relation to other variables

MODEL 1: all main variables considered and "price_per_person"

MSE: 0.0002944855102515150 7
RMSE: 0.0171605801257275 4
R2: 0.1057484383266413 8

MODEL 2: 4 main correlations to "price_per_person": 'instant_bookable_new', 'distance_to_louvre', 'room_type_cat', 'availability_365'

MSE: 0.0003049670806069847 5
RMSE: 0.0174633066916602 24
R2: 0.0739195016459792 7

MODEL 3: only the 2 strongest correlations to 'price_per_person': distance_to_louvre', 'availability_365'

MSE: 0.0003101977772071217 2
RMSE: 0.0176124323155893 82
R2: 0.0580356844540015 35

Model 1 is the most accurate model.

Conclusion

& thank you !