Models Info Document

In the Folder you will find two. ipynb Files – have a look into the Airbnb Models.ipynb File – there you will find explanations and everything relevant for the Webapp.

General Information

For the Webapp you will need 3 Models

- predict_airbnb_price.sav -> Predicts the Price per night of an Airbnb
- predict_cost_of_cleaning.sav -> Predicts the Cost for 1 Cleaning
- predict_renting_price.sav -> Predicts the Monthly rent of an appartement

You can import the .sav models and predict with them like this:
(don't forget to import pickle)

```
loaded_model_renting_prices = pickle.load(open(path+filename_renting_price, 'rb'))
y_pred = loaded_model_renting_prices.predict(X_test_Renting_pred_pickle))
```

I imported every model again in the Airbnb Models.ipynb file – so you can just have a look how I handled it there.

Input fields needed

To get the data needed for all predictions you will need to get the following inputs:

- host is superhost (bool)
- host listings count (int)
- host identity verified (bool)
- bathrooms_text (int) -> no. of bathrooms
- bedrooms (int)
- Arrondissement (1 to 20)
- Room_type (Entire home/apt; Hotel room; Private Room; Shared Room)
- Amenities (Kitchen, Wifi, Bathtub, Elevator, Air conditioning, Pets allowed, TV, Private entrance, balcony, City skylinie view)
- Number of Rooms (needed just for the prediction of the renting price)

How to calculate the Airbnb profit per month

1. Predict price/night with the model
2. Predict revenue/month
    a. Price p. night * 30* occupation per arrondissement in % -> occupancy_arrondissement.csv (https://www.airroi.com/atlas/map/?country-code=FR&state=Ile\-de\-France&city=Paris&neighborhood=1st-Arrondissement
3. Predict cost per cleaning with the model
4. Predict cost of cleaning per month
    a. number of monthly cleanings = (30*occupation)/4.8 (4.8 days is the average length of an Airbnb stay in paris https://airbtics.com/tourism-statistics-paris-fr/)
    b. number of monthly cleanings * cost p. cleaning

= Profit per month

How to calculate the Renting profit

1. Predict renting price with the model

You can decide on how to display it, perhaps I would display two prices one when it is furnished and one when it is not furnished

(If something does not make sense to you or I did a mistake pls tell me - Aurel)

Features for the Models

X for predict_airbnb_price.sav:

```
Data columns (total 39 columns):
 #   Column                  Non-Null Count  Dtype
---  ------                  --------------  -----
 0   host_is_superhost       4140 non-null   bool
 1   host_listings_count     4140 non-null   float64
 2   host_identity_verified  4140 non-null   bool
 3   bathrooms_text          4140 non-null   float64
 4   bedrooms                4140 non-null   float64
 5   Arrondissement_10e      4140 non-null   bool
 6   Arrondissement_11e      4140 non-null   bool
 7   Arrondissement_12e      4140 non-null   bool
 8   Arrondissement_13e      4140 non-null   bool
 9   Arrondissement_14e      4140 non-null   bool
 10  Arrondissement_15e      4140 non-null   bool
 11  Arrondissement_16e      4140 non-null   bool
 12  Arrondissement_17e      4140 non-null   bool
 13  Arrondissement_18e      4140 non-null   bool
 14  Arrondissement_19e      4140 non-null   bool
 15  Arrondissement_1er      4140 non-null   bool
 16  Arrondissement_20e      4140 non-null   bool
 17  Arrondissement_2e       4140 non-null   bool
 18  Arrondissement_3e       4140 non-null   bool
 19  Arrondissement_4e       4140 non-null   bool
 20  Arrondissement_5e       4140 non-null   bool
 21  Arrondissement_6e       4140 non-null   bool
 22  Arrondissement_7e       4140 non-null   bool
 23  Arrondissement_8e       4140 non-null   bool
 24  Arrondissement_9e       4140 non-null   bool
 25  room_Entire home/apt    4140 non-null   bool
 26  room_Hotel room         4140 non-null   bool
 27  room_Private room       4140 non-null   bool
 28  room_Shared room        4140 non-null   bool
 29  has_kitchen             4140 non-null   int64
 30  has_wifi                4140 non-null   int64
 31  has_bathtub             4140 non-null   int64
 32  has_elevator            4140 non-null   int64
 33  has_air_conditioning    4140 non-null   int64
 34  has_pets_allowed        4140 non-null   int64
 35  has_tv                  4140 non-null   int64
 36  has_private_entrance    4140 non-null   int64
 37  has_balcony             4140 non-null   int64
 38  has_city_view           4140 non-null   int64
```

X for predict_cost_of_cleaning.sav:

```
#   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   Bedroom   11 non-null     int64
 1   Bathroom  11 non-null     int64
dtypes: int64(2)
```

X for predict_renting_price.sav:

```
Data columns (total 23 columns):
 #   Column                          Non-Null Count  Dtype
---  ------                          --------------  -----
 0   Nombre de pièces principales    1792 non-null   int64
 1   Arrondissement_10e              1792 non-null   bool
 2   Arrondissement_11e              1792 non-null   bool
 3   Arrondissement_12e              1792 non-null   bool
 4   Arrondissement_13e              1792 non-null   bool
 5   Arrondissement_14e              1792 non-null   bool
 6   Arrondissement_15e              1792 non-null   bool
 7   Arrondissement_16e              1792 non-null   bool
 8   Arrondissement_17e              1792 non-null   bool
 9   Arrondissement_18e              1792 non-null   bool
 10  Arrondissement_19e              1792 non-null   bool
 11  Arrondissement_1er              1792 non-null   bool
 12  Arrondissement_20e              1792 non-null   bool
 13  Arrondissement_2e               1792 non-null   bool
 14  Arrondissement_3e               1792 non-null   bool
 15  Arrondissement_4e               1792 non-null   bool
 16  Arrondissement_5e               1792 non-null   bool
 17  Arrondissement_6e               1792 non-null   bool
 18  Arrondissement_7e               1792 non-null   bool
 19  Arrondissement_8e               1792 non-null   bool
 20  Arrondissement_9e               1792 non-null   bool
 21  Type de locationom_meublé       1792 non-null   bool
 22  Type de locationom_non meublé   1792 non-null   bool
```