



Predicting total rent amount

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- Every day are looking for a house to rent. They try to find a good deal;
- It takes a lot of time to do;
- To support this people I create a predictive model to identify the **total rent amount** and what influences this value;

Predicting total rent amount

- In addition, we can answer other some questions, too:
- *Is the total rent amount in line with other similar properties?*
- *What characteristics should I consider in order to lower the total rent amount?*
- *If I add, for example, an additional bathroom what happens to total rent amount?*

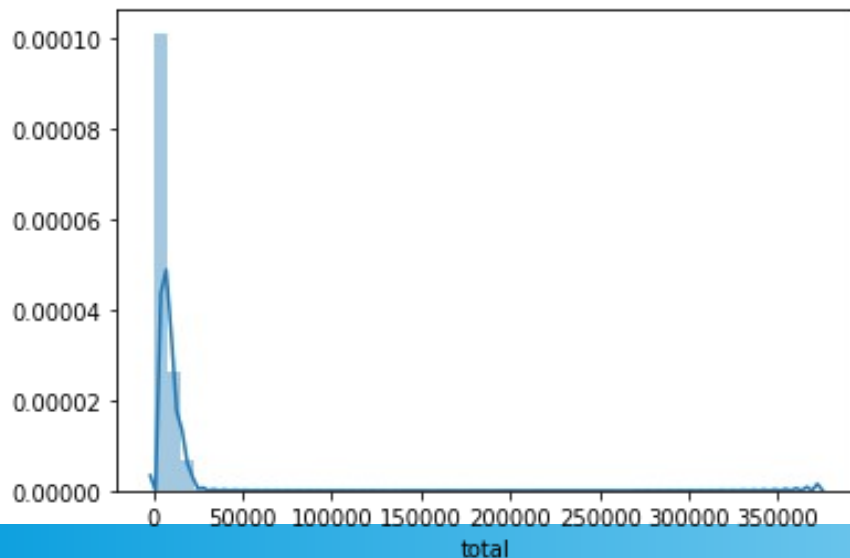
Data acquisition and cleaning

- Dataset houses to rent in two different cities in Brazil (<https://www.kaggle.com/rubenssjr/brasilian-houses-to-rent>);
- Contains 6079 houses to rent with 13 features;
- Cleaned 9 features to correct use on models;

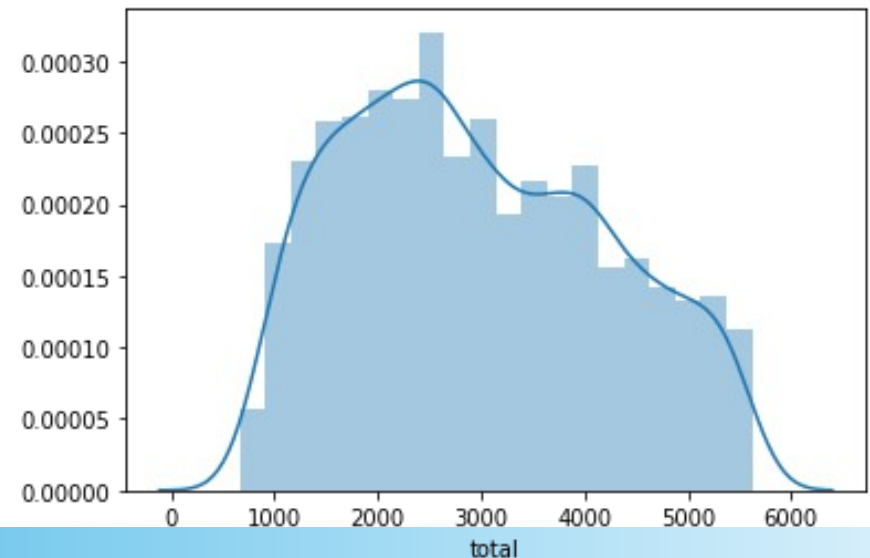
Data acquisition and cleaning

- Verified data distribution e identified that we need to remove outliers;
- After quantiles analysis (0.25-0.75) I removed rows with total rent amount greater than 5622.50. So, we worked with 3849 houses.

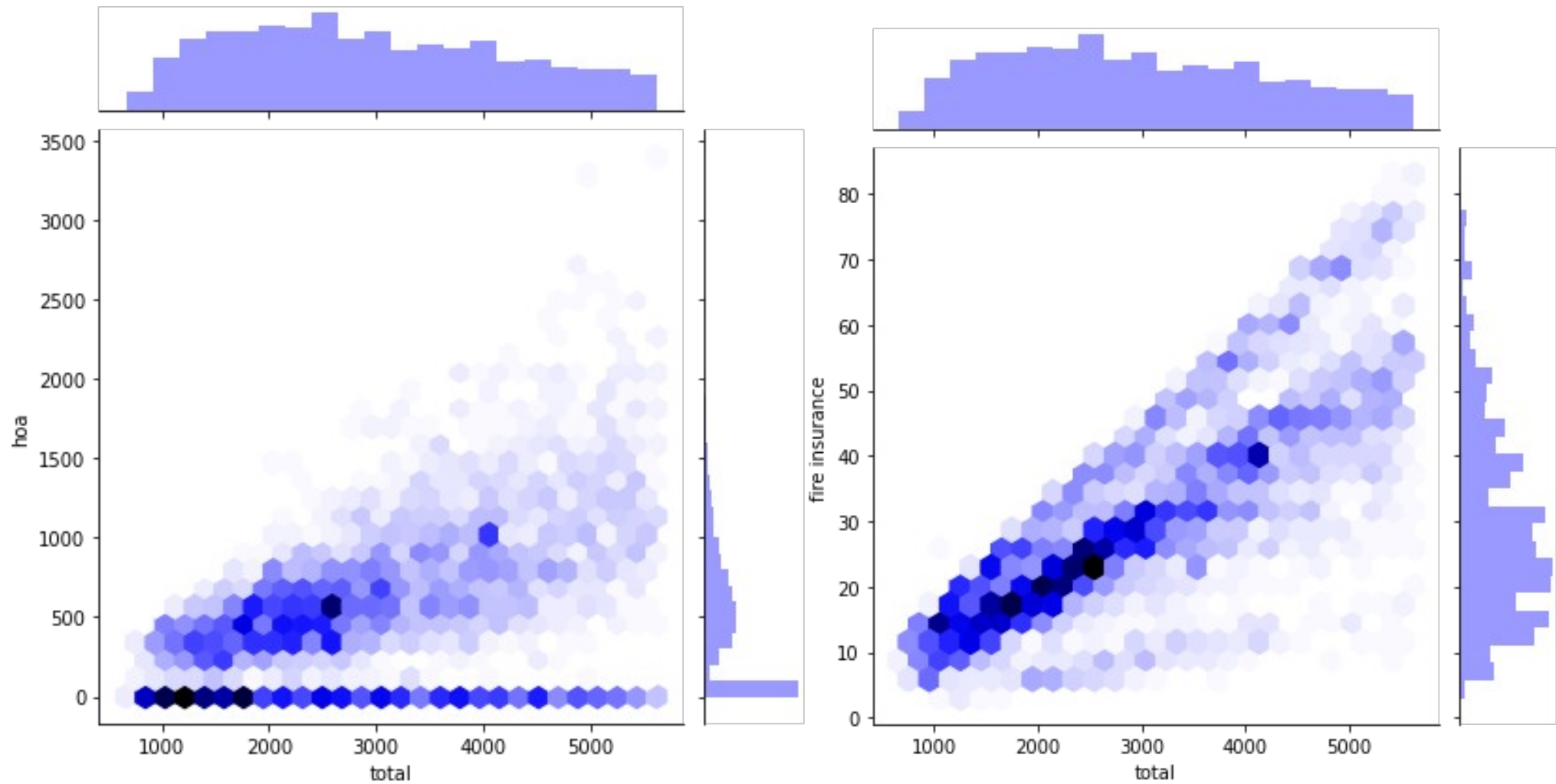
Before



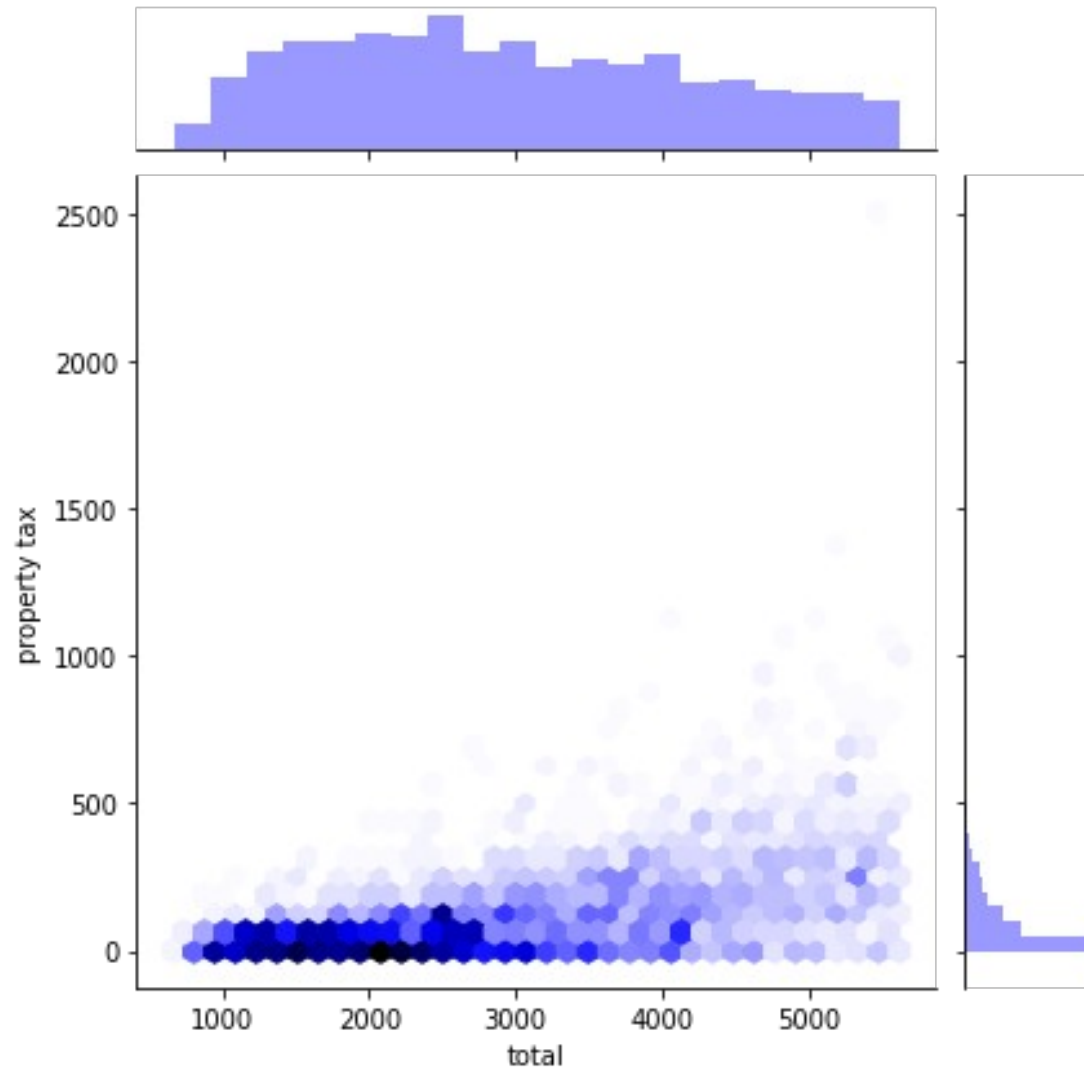
After



Total rent amount x other components



Total rent amount x other components



Predictive Models

- I use Regression Models to predict total value amount;
- Random Forest Regressor has the best Mean Absolute Error;
- Others MAE, see table:

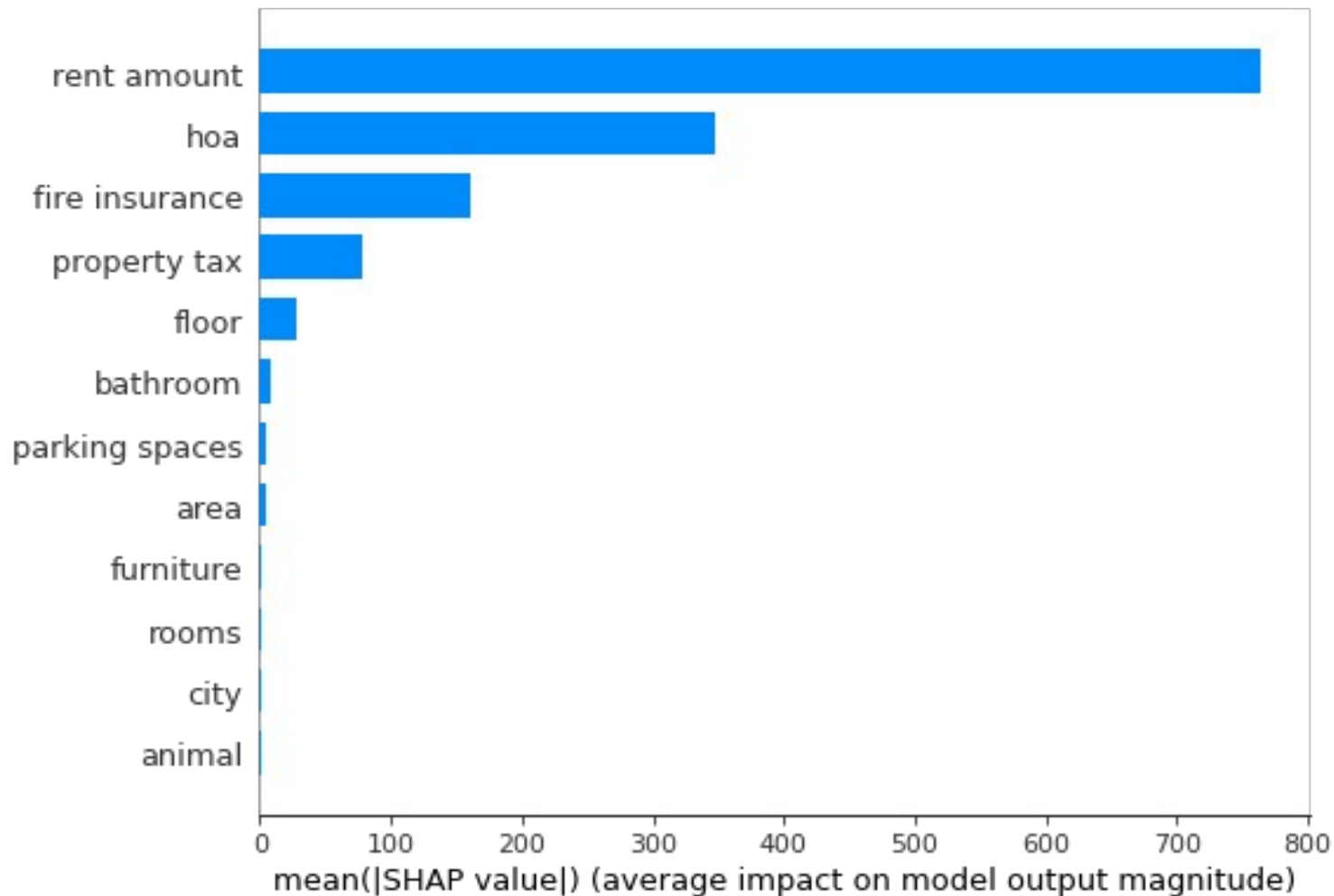
Model	MAE
KNN Regressor (k=5)	211.2968831168831
Decision Tree Regressor (n=15)	73.74767470624613
Extra Tree Regression	105.2414730375486
Random Forest Regression	42.4924805194805

Correlation Features Heatmap



- We can see the high correlation among total (total rent amount) and house characteristics (rooms, bathroom and parking spaces);
- Area is has not a big influence in total;
- Property tax, fire insurance and hoa (homeowners association tax) have more corretation with total.

SHAP Analysis Random Forest



- Again we can see basically the same relationship.

Conclusion and Orientations

- Who want to rent a house must pay attention with:
 - Number of bathroom, parking spaces and rooms have high influence into total value amount;
 - Fire Insurance and hoa, too;