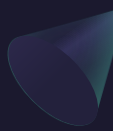
NYC property price prediction

Supervised Learning

By Gaukhar Javarova

Agenda

- Introduction of the data.
- This model building framework could be adjusted to build models for different markets.
- Model specifications (chosen features)
- Who are potential users of the model and why do they need to use it?
- Model details

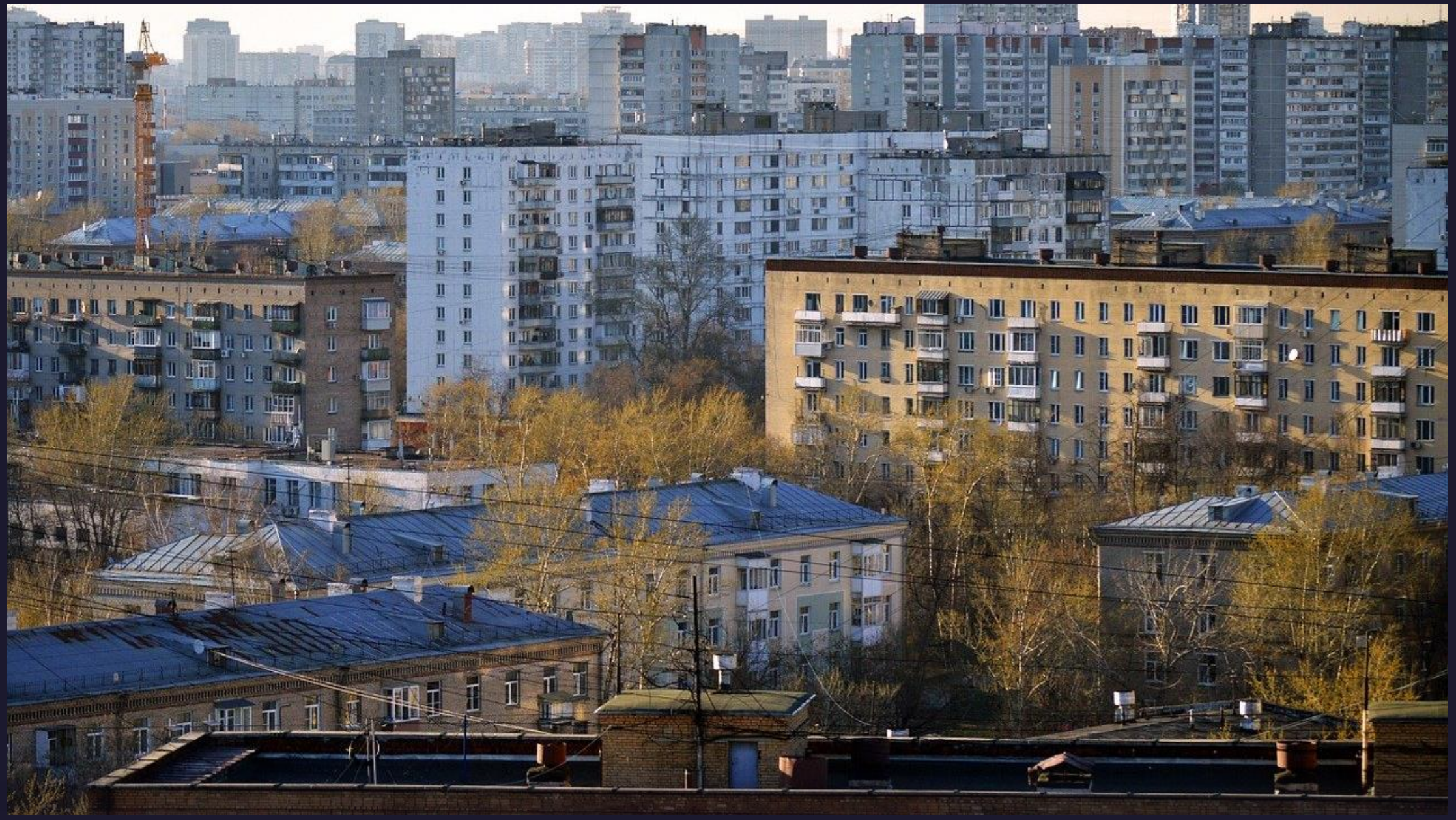


DATA

- 56.430 properties used for the research which were sold in NYC over 12-m. from 09/ 2016 - 09/2017
- Data includes price, type of units, total square feet, location
- Raw data can be found here: NYC-properties

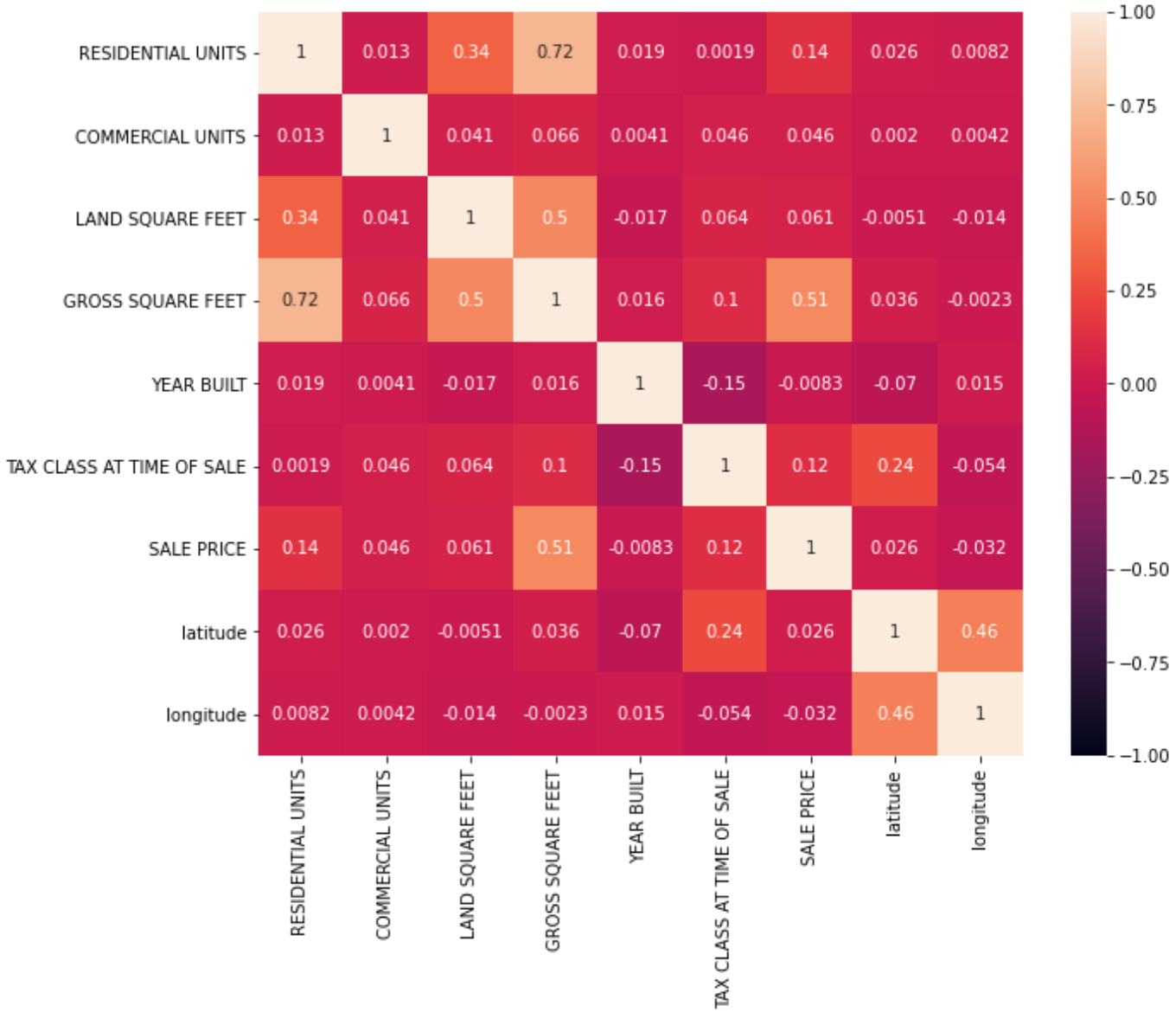
The USA

Post - Soviet Union Countries

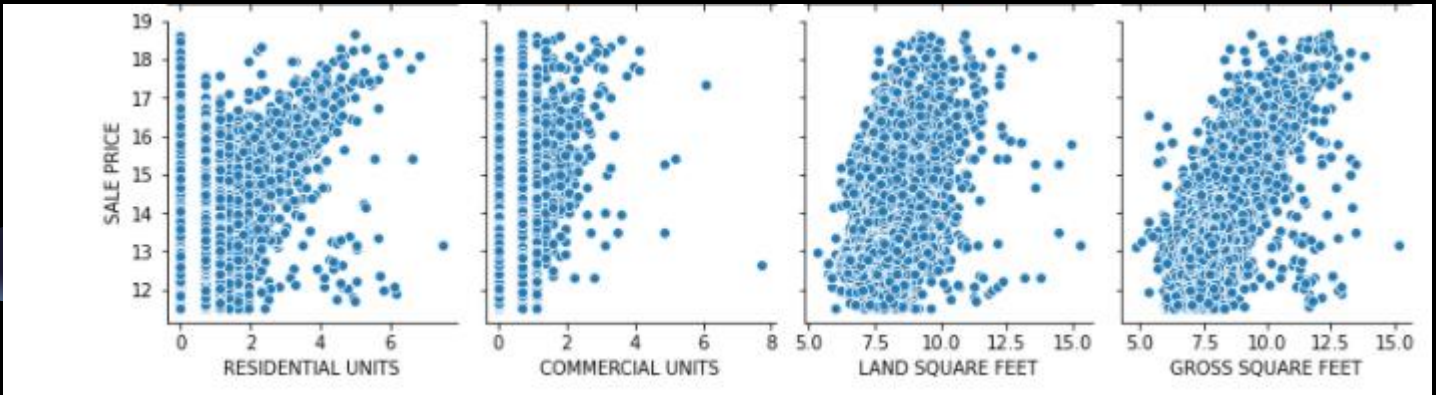


Bangladesh

Properties Price prediction



MODEL SPECIFICATIONS



- SALE PRICE is affected by LAND AND GROSS SQUARE FEETS
- Residential Units have 0 commercial units.
- Commercial Units have 0 residential units

TAX CLASS and BUILDING CLASS CATEGORY

The most important features for model predicting

	feat	importance
6	TAX CLASS AT TIME OF SALE	0.539767
0	BUILDING CLASS CATEGORY	0.381300
2	COMMERCIAL UNITS	0.037202
9	longitude	0.022937
8	latitude	0.018794
1	RESIDENTIAL UNITS	0.000000
3	LAND SQUARE FEET	0.000000
4	GROSS SQUARE FEET	0.000000
5	YEAR BUILT	0.000000
7	BUILDING CLASS AT TIME OF SALE	0.000000
10	year	0.000000
11	month	0.000000

Who are the users?

- Banks
- Individual Investors
- Real Estate Agencies
- Hedge Funds
- House flippers

Model details

- MAE = On average the model's predictions are $651172.15 from the right answer
- MAPE - On average the model's predictions are 40% from the right answer
- Underpredicts very high-priced buildings
- Had to be tuned for the user and be improved (taking into consideration categories like crime, colleges, demographics, school, governmental or commercial city)

Key takeaways:

- This model framework can be tuned into any city's/country's Real Estate
- Have an edge on predicting prices in rural areas for an investment
- Great for countries where RE prices are not stable, people don’t know the real value.
- RE investors can see the price difference in RE all around the world and choose the country to invest in.

Any questions?

THANK YOU!