Dwelling Energy Insights – Week 12

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Done in sprint 6

- Implement different approaches (predict heating system type)

- Prepare new dataset of 120 houses

- LSTM Network

- Clean up our server environment

- Continue writing the research paper (feedback from the introduction)

- Start writing the portfolio

Approaches (Predicting heating system type)

1 model

Q: Which type of heating system does it have?
 A_1: E
 A_2: WP
 A_3: Zon

64% → 96%

3 different models

Q_1: Does it have E?
 A_1: Yes/No
Q_2: Does it have WP?
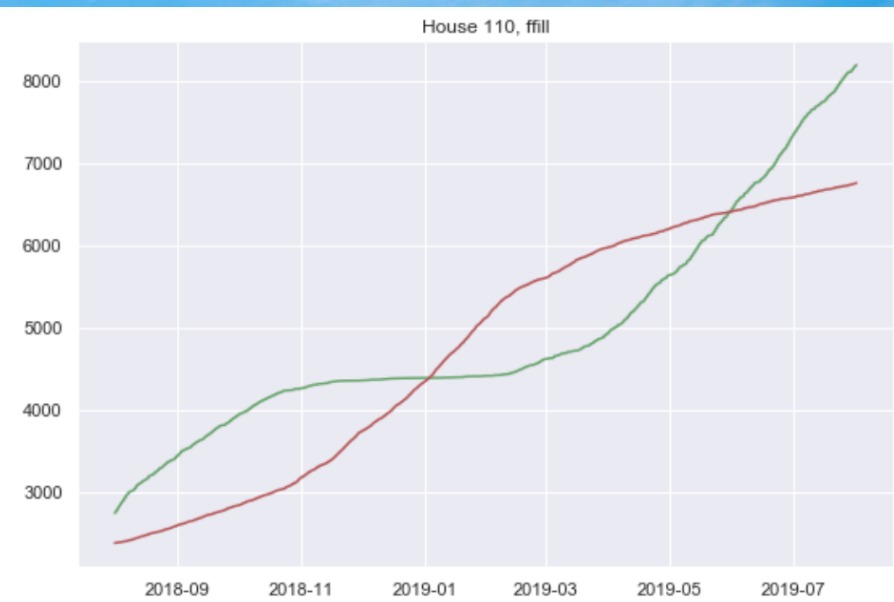 A_2: Yes/No
Q_3: Does it have Zon?
 A_3: Yes/No

72%

74%
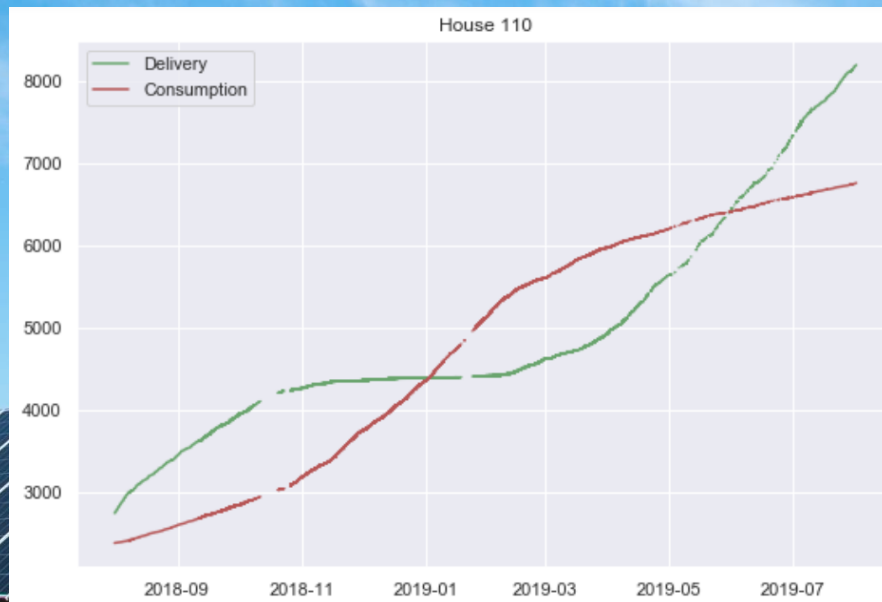
85%

120 Houses Dataset

- Data Information:
  - 10 months of data
  - 5 min interval ➡ 15 min interval
  - Waiting for labels

delivery	consumption	T	SQ	Q	N	hour	day	week	month
0.0	0.000	15.0	4.0	84.0	8.0	13	24	43	10
0.0	0.449	15.0	4.0	84.0	8.0	13	24	43	10
0.0	0.504	15.0	4.0	84.0	8.0	13	24	43	10
0.0	0.578	15.0	4.0	84.0	8.0	13	24	43	10
0.0	0.914	14.0	0.0	35.0	8.0	14	24	43	10

- Data Cleaning:

LSTM

Predictions per 15 min

1-day sample

ZON result have almost 0%

WP result have 99%

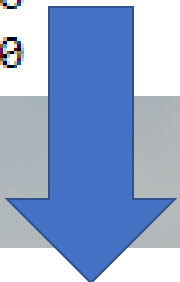**E result have almost 0.00013%**

```
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       [2.82330334e-01, 5.32915473e-01, 1.84754133e-01],
       [2.09159300e-01, 6.86692715e-01, 1.04147986e-01],
       [1.52562246e-01, 7.40361571e-01, 1.07076220e-01],
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       [2.07578734e-01, 5.09048998e-01, 2.83372223e-01],
       [1.98779881e-01, 4.79200125e-01, 3.2020024e-01],
       [1.93948403e-01, 5.03616750e-01, 3.02434832e-01],
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```

LSTM

**Long short-term memory** predicting **heating system**

Confusion matrix of the classifier
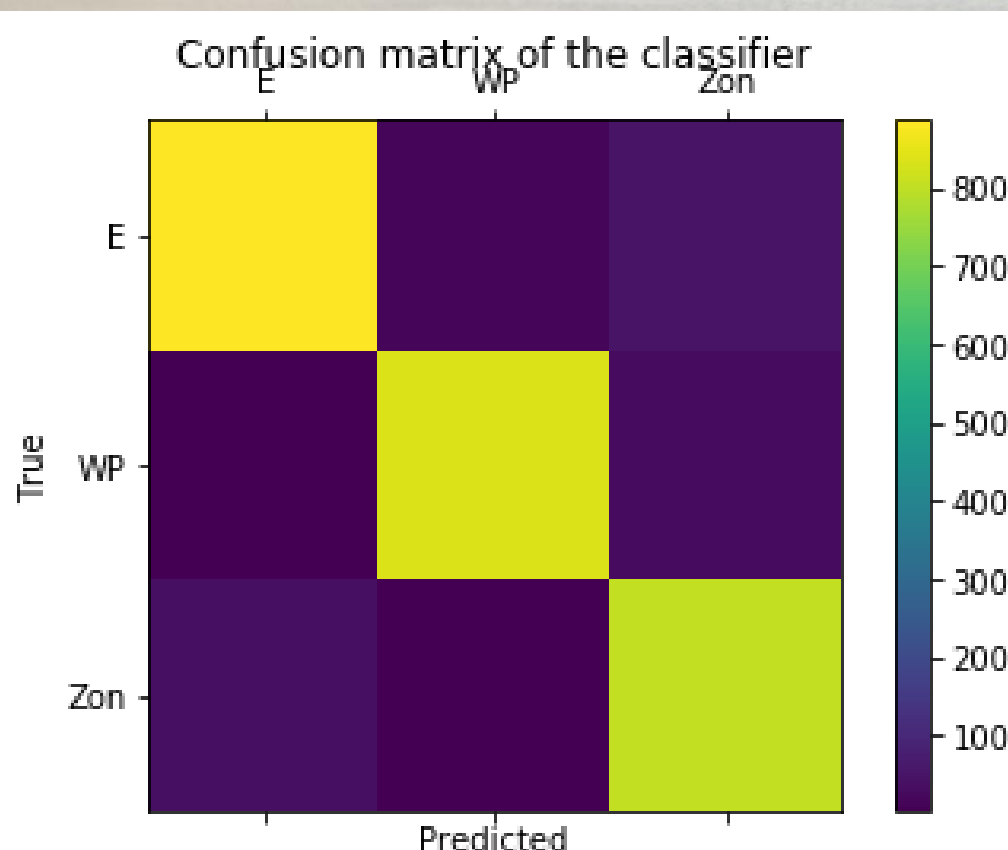
		precision	recall	f1-score
E	1.0	0.81	0.92	0.86
WP	2.0	0.97	0.95	0.96
Zon	3.0	0.91	0.82	0.87
accuracy				0.89
macro avg		0.90	0.90	0.90
weighted avg		0.90	0.89	0.89

		precision	recall	f1-score
E	1.0	0.95	0.93	0.94
WP	2.0	0.98	0.96	0.97
Zon	3.0	0.91	0.95	0.93
micro avg		0.95	0.95	0.95
macro avg		0.95	0.95	0.95
weighted avg		0.95	0.95	0.95

LSTM

Long short-term memory predicting
number of solar panels

Confusion matrix of the classifier
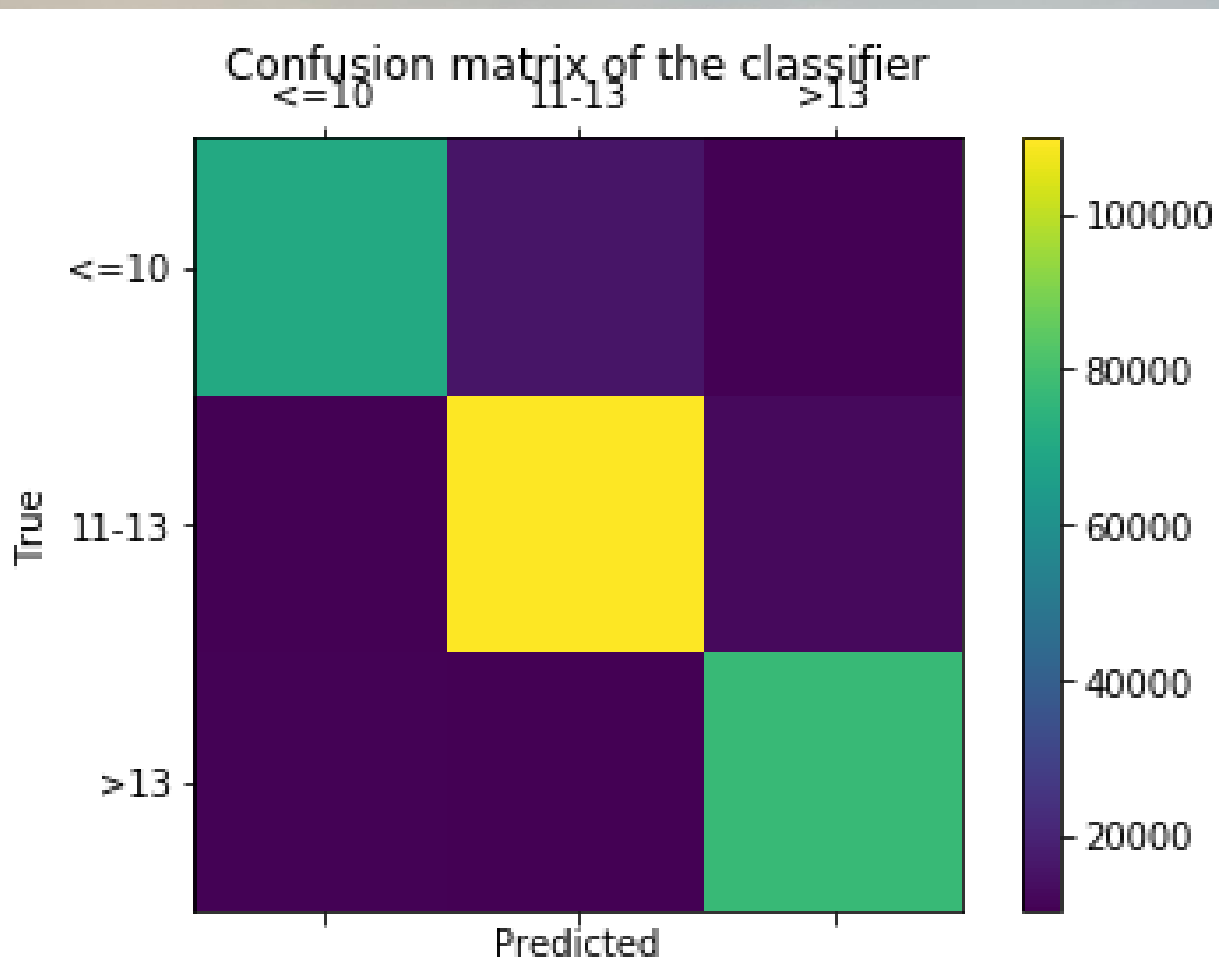
	precision	recall	f1-score
<=10 1.0	0.75	0.79	0.77
11-12 2.0	0.72	0.66	0.69
>12 3.0	0.69	0.69	0.69
accuracy			0.73
macro avg	0.72	0.72	0.72
weighted avg	0.73	0.73	0.73

	precision	recall	f1-score
<=10 1.0	0.77	0.73	0.75
11-12 2.0	0.81	0.83	0.82
>12 3.0	0.77	0.78	0.78
micro avg	0.78	0.78	0.78
macro avg	0.78	0.78	0.78
weighted avg	0.78	0.78	0.78

LSTM

Long short-term memory predicting **number of people**
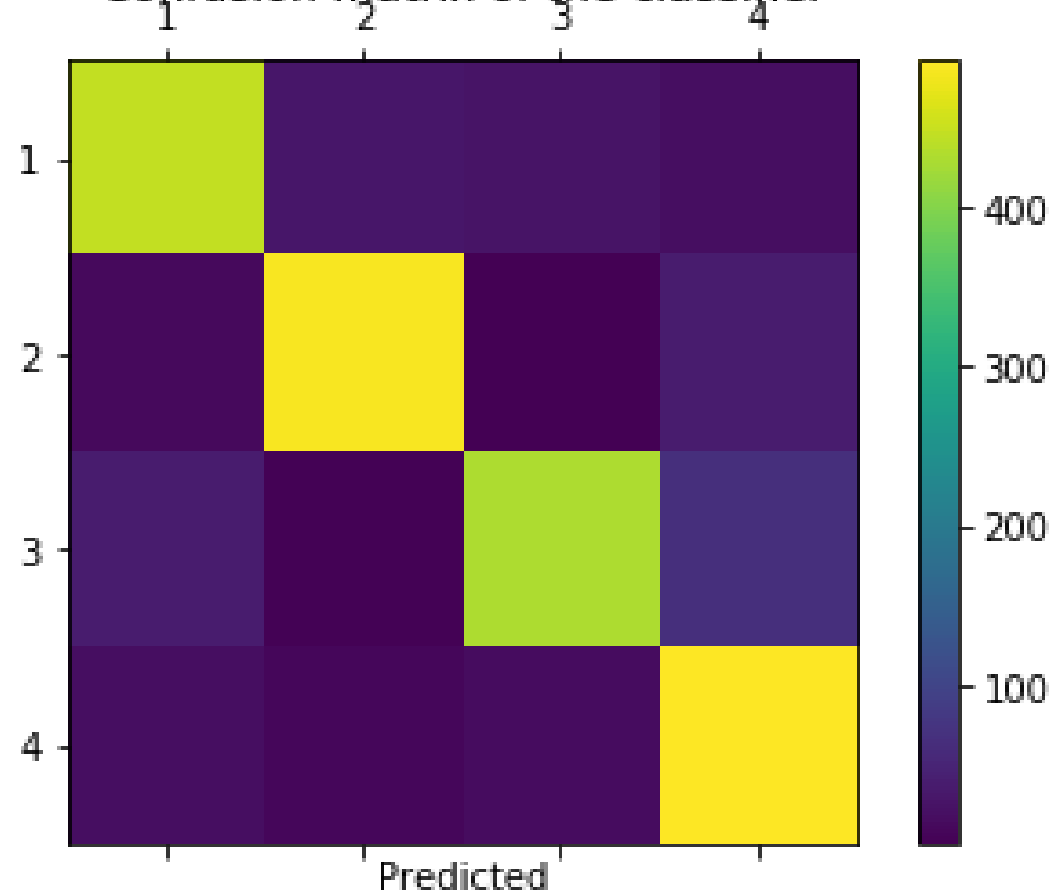
	precision	recall	f1-score
1.0	0.64	0.85	0.73
2.0	0.89	0.61	0.73
3.0	0.54	0.14	0.22
4.0	0.57	0.85	0.68
accuracy			0.66
macro avg	0.66	0.61	0.59
weighted avg	0.67	0.66	0.62

Confusion matrix of the classifier

	precision	recall	f1-score
1.0	0.86	0.85	0.86
2.0	0.92	0.90	0.91
3.0	0.91	0.80	0.85
4.0	0.80	0.91	0.85
micro avg	0.87	0.87	0.87
macro avg	0.87	0.87	0.87
weighted avg	0.87	0.87	0.87

LSTM

Long short-term memory predicting **Wats delivery**

Confusion matrix of the classifier using Wp
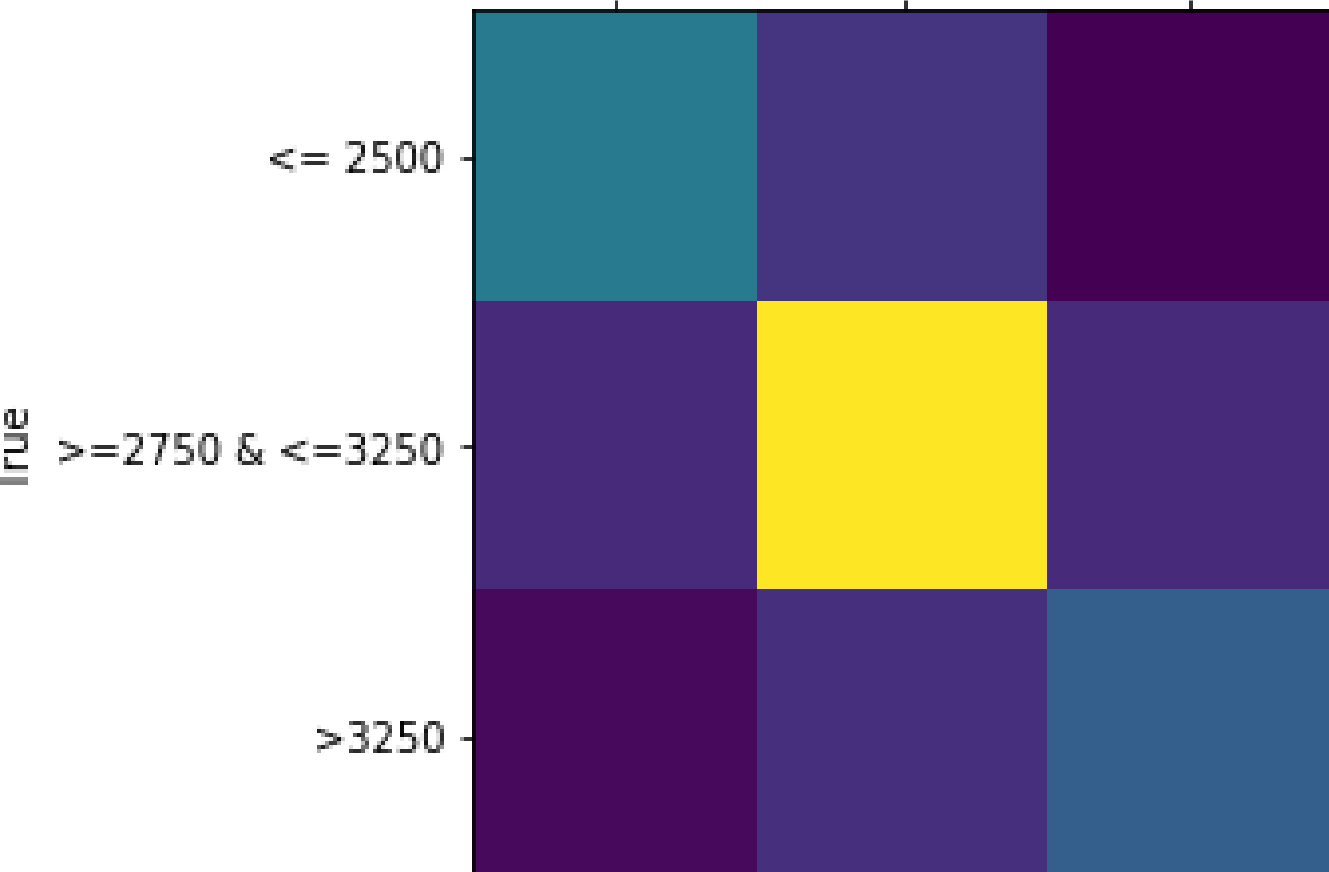
	precision	recall	f1-score
1.0	0.70	0.70	0.70
2.0	0.76	0.79	0.77
3.0	0.68	0.62	0.65
micro avg	0.73	0.73	0.73
macro avg	0.71	0.70	0.71
weighted avg	0.73	0.73	0.73

Remaining tasks

- Try our models on the new dataset with 120 houses

- Resume writing the research paper (Introduction & Techniques - Methods)

- Resume writing the portfolio

Questions/Feedback

- Are there any questions or feedback based on this presentation?