CS771: Assignment 3

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1 Linear model

For the linear model, we tried the below learning methods for predicting O_3 and NO_2 values. For each, the following were the mean absolute error (MAE) concerning training data. The four voltage values from the sensor were used in this case. According to the data obtained, the **SVM** way of learning had the minimum error values.

Learning Method	O_3	NO_2
Linear Regression	5.62	6.54
SVM	5.67	6.2
Elastic Regression	5.68	6.61
Ridge Regression	5.63	6.54
Lasso Regression	5.68	6.62

Figure 1: MAE values in linear models

2 Non-Linear model

For Non-Linear learning, Random trees and neural network approaches were used. We obtained the below mean absolute error (MAE) data concerning them. This time, the four voltage values, timestamp, humidity and temperature conditions were also considered. The error values were significantly less than the linear ones, with the least in **Random Forest** method.

	O3		NO2	
	test	train	test	train
Random Forest	3.29	1.2	2.02	0.75
Neural Networks	3.48	3.1	2.47	2.16

Figure 2: MAE values in Non-linear models

3 Code

Considering the Random Forest way, which resulted in the least MAE value, its pkl dump is created for both NO_2 and O_3. The **submit.py** along with the pkl dump is zipped as the final submission.

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