CAT-A-THON

Data Mining Project Using Telematics Data to Predict Engine Failures
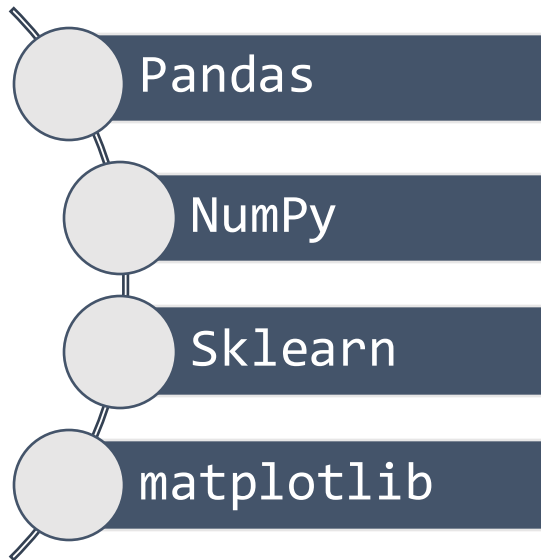
Team – Artana

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PSG
College of Technology
ISO certified 9001:2015

Tools used

Python 3.9.x

Libraries used :

Pandas

NumPy

Sklearn

matplotlib

Algorithm used :

Polynomial regression for regression analysis (Prediction)

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Process flow

Data pre-processing and Data Extraction

Exploratory data analysis is performed & required data is extracted using Pandas

Data visualization and Model building & training

The data is visualized using matplotlib and the model is built and is trained using the data with sklearn.

Value prediction

The model is visualized and the value is predicted using Polynomial regression

Explanation and Suggestions

How the algorithm works?

- Identifies a suitable N^{th} degree polynomial which relates between the dependent and independent variables and uses this to predict values.

- Independent variable – "date" field

- Dependent variable – "weighted units" field

- Weighted units is the product of unit and no of occurrence field.

- This regression approximates the polynomial function which assists us in finding the date before engine failure.

Suggestions :

- Model can predict the dates remaining to replace the candidate before the engine failure.

- The model will provide you the date before the failure threshold.

- The suggestions are based upon severity levels.(1, 2 and 3).

Severity level	Criticality of replacement
1	Highly critical level
2	Moderately critical level
3	Minor

Visualized polynomial

Threshold prediction
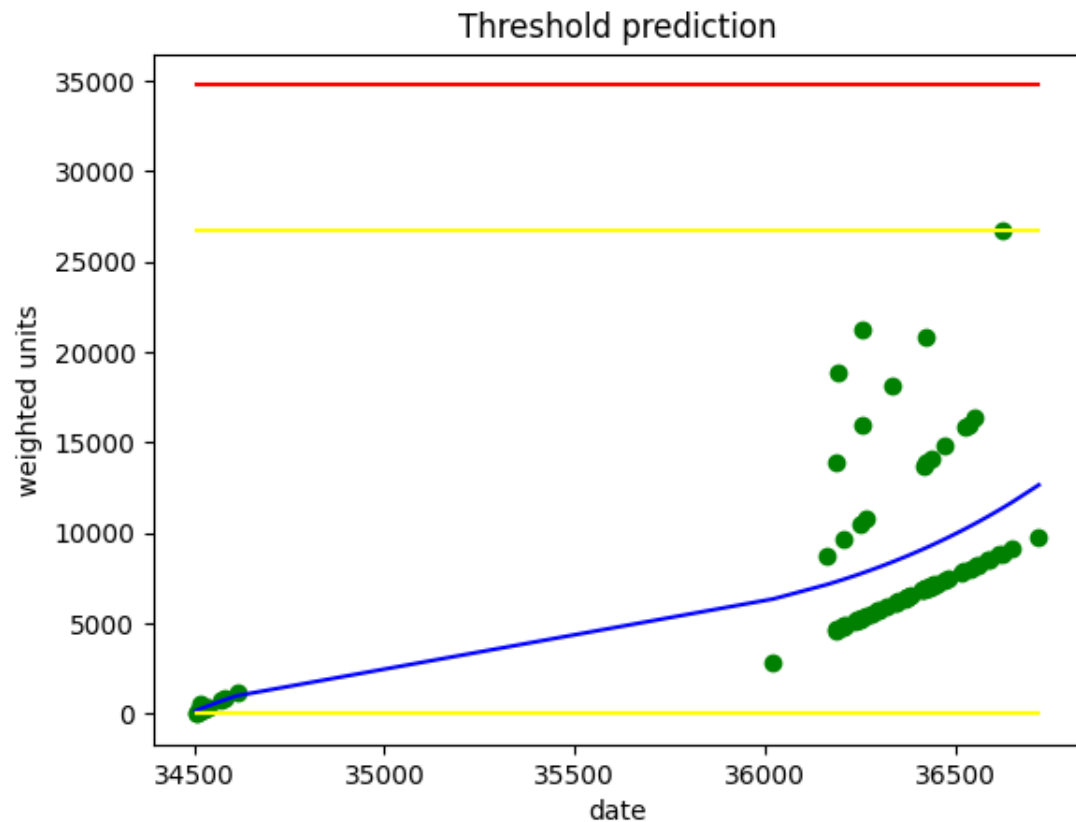
Key

- Predicted polynomial
- Original values used for training
- Severity levels
- Threshold level

Code output

```
(env1) D:\Hari Sriram\~Coding~\NLP>python matplotlibtest.py
Candidate: ABCDE00001
Event(sensor): Component2_discreteSensorH_Up

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The date when threshold is hit:  37624

The date when severity level reaches 1 : 37380
The current severity level is: 2
Criticality: Moderately critical
Replace the candidate within 904 dates
```

Thank you!

Regards, Team - Artana

-Kaushik S

-Harihararam S

Resources (Project code)

Google Colab link – [Click here]