To,
IITD-AIA Foundation of Smart Manufacturing

Subject: **Weekly Progress Report for Week 5**

Dear Sir,
Following is the weekly progress report dating from 3rd July to 9th of July, 2023. I went ahead and researched on shearing machine and practiced on Datasets for a clearer understanding of the things.

My Understanding of the Project: INTP23-ML-5: Equipment Failure Prediction for Predictive Maintenance

Predictive Maintenance is the procedure of using already existing data of various factors which might cause equipment failure and using those data available to us to predict when an equipment might fail in the future. It basically works on the principle of Condition Monitoring. Condition-monitoring tools combined with artificial intelligence and machine learning techniques forecast expected machine failure.

Predictive maintenance helps in:

- reducing maintenance costs
- maintenance scheduling and planning
- improving reliability.

With the help of such technologies, we can predict and perform maintenance activities without disrupting normal machine activities.

Weekly Progress:

3rd July 2023:
Read CNC's Machine Tool Wear Diagnostic Paper

- I read the paper from the github repository.
- I learned about prognostic steps of the system prediction
- I couldn't work on the dataset due to prior commitments but will surely work more on it tomorrow.

4th July 2023:
N/A (Was not able to submit my daily report on time due to prior important commitments)

5th July 2023:
Practiced on CNC Mill Tool Dataset

- I went through the paper from the GitHub repository again to get a clearer understanding of it.
- I utilized numpy, matplotlib, seaborn for data visualization
- I used sklearn and utilized RandomForestClassifier and fine-tuned it to receive maximum accuracy.

6th July 2023:
Watched a YouTube video explaining various models

- I understood boosting algorithms and stacking ensemble learning
- I also learned about logistic and linear regression
- I also looked into unsupervised learning.

7th June 2023:
Practiced on Global Emission Dataset

- I utilized numpy, pandas, seaborn
- I also learned ploty.express since it was a unique tool which i found out via an article on medium
- I also utilized it for visualization purposes

8th July 2023:
Predicted on Breast Cancer Prediction Dataset

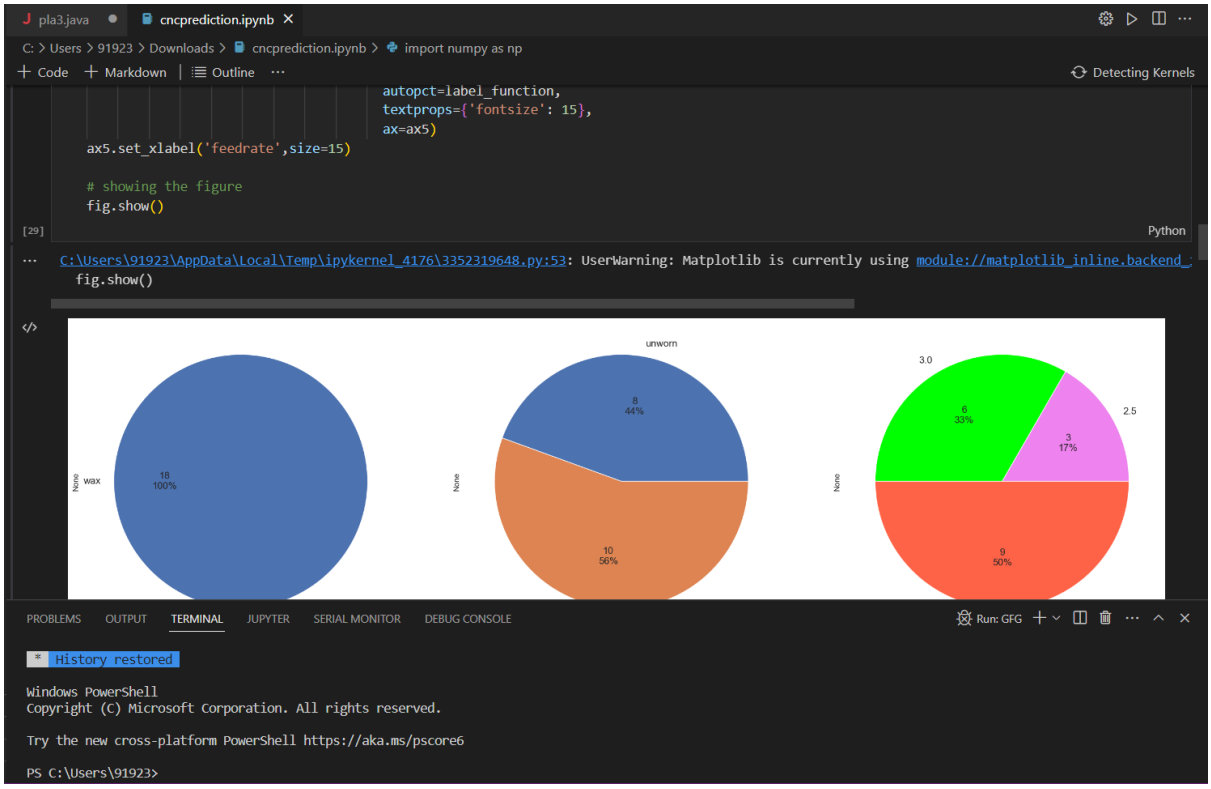
- I utilized numpy, pandas, sklearn for the dataset.
- I also learned fastai.tabular.all for the dataset
- I also looked into Benign and Malignant for my dataset prediction.

9th July 2023:
Revised on previous dataset code's

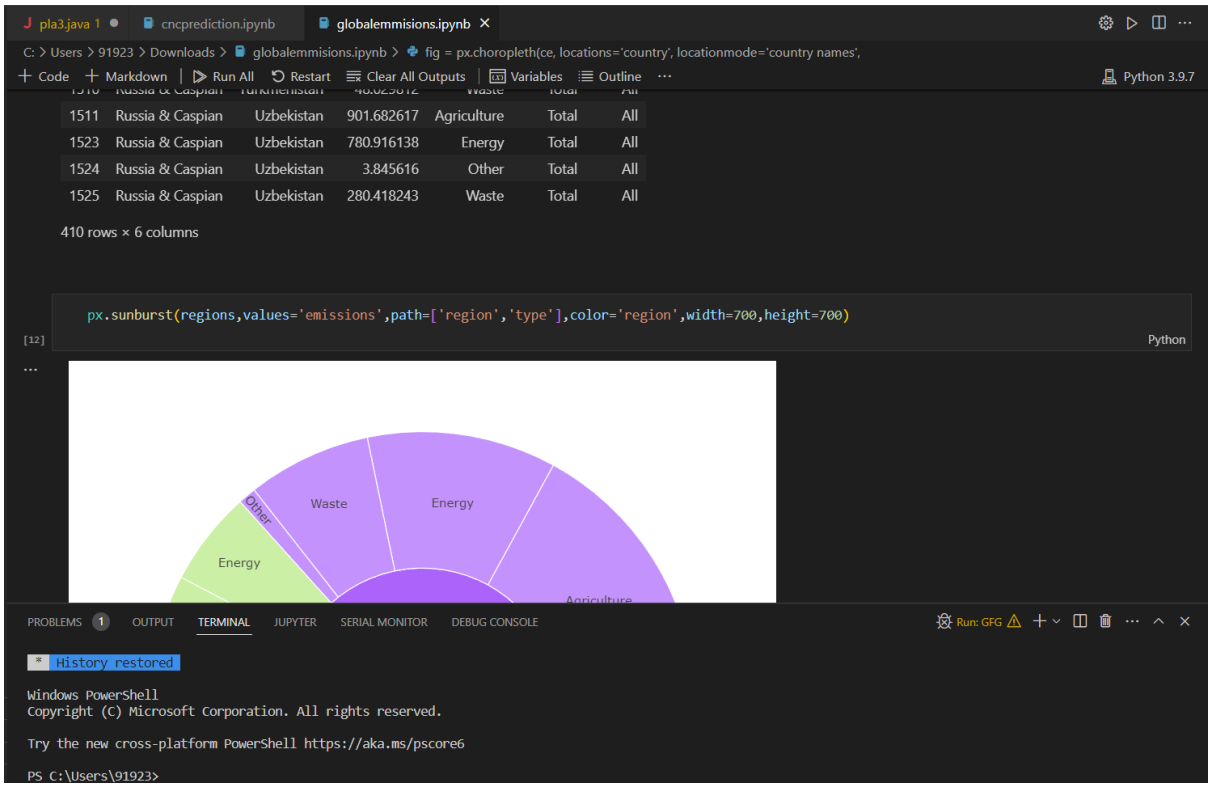
- I went through some of the errors in a few coding files I did before
- I was able to rectify some errors and was able to understand where I went wrong.

GitHub Repository: https://github.com/JehanPatel/FSM-INT-2023

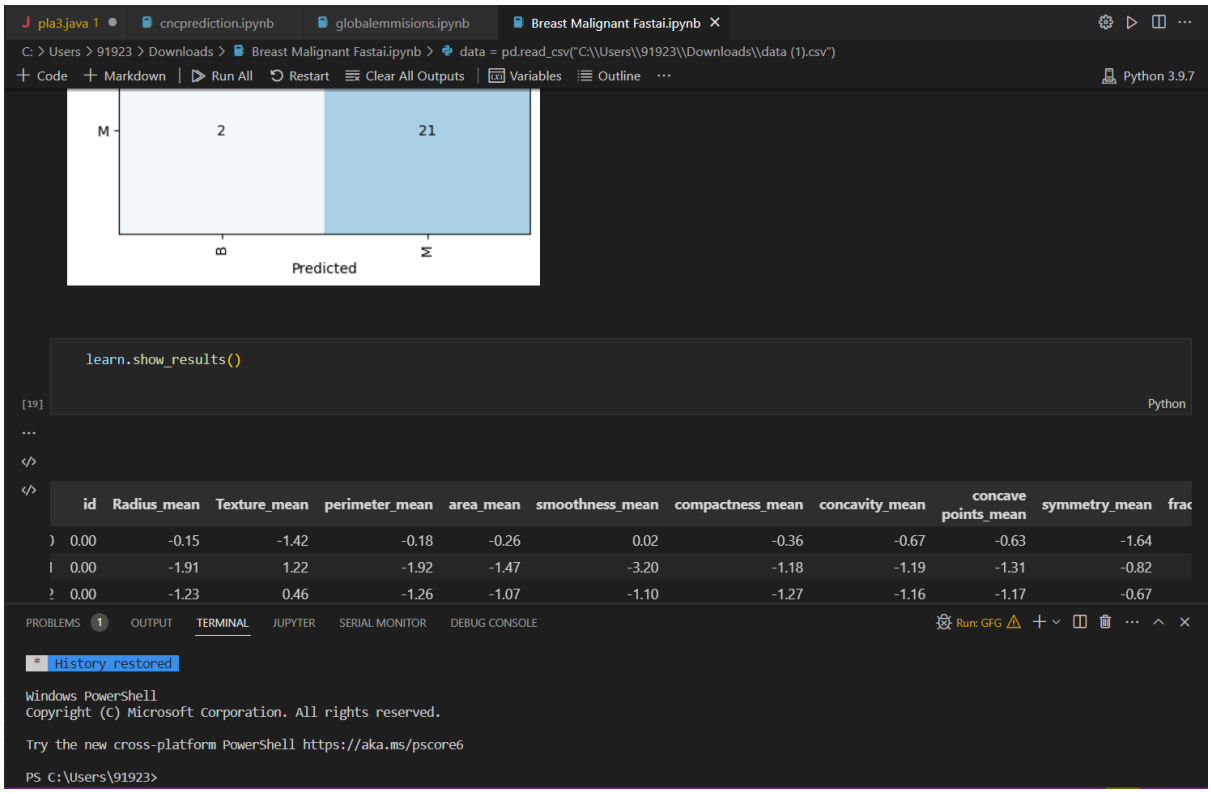
CNC Prediction



Solar Prediction



Breast Cancer Prediction



Utilizing one of my favorite data visualization model