To,
IITD-AIA Foundation of Smart Manufacturing

Subject: **Weekly Progress Report for Week 7**

Dear Sir,
Following is the weekly progress report dating from 17th July to 23rd 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:

17th July 2023:
Finished on Stanford Machine Learning videos from YouTube

- I watched and understood about debugging and error handling for ML.
- I also went through Maximization Algorithms.
- I went ahead and also finished Linear Dynamical System.

18th July 2023:
Read articles on Machine Learning from Medium.

- I read about Deep Neural Networks.
- I also read about weights and biases.
- I also learned the basics of forward propagation.
- I also went through Gradient Descent and its formula.

19th July 2023:
Practiced on Cryptocurrency Dataset from Kaggle.

- I used tensorflow keras for various models and layers used in the code
- I also used numpy and pandas in the code
- I also utilized sklearn module and XRP Model

20th July 2023:
Practiced on Marathon Runner Dataset from Kaggle.

- I used numpy and pandas in the code.
- I also used sklearn module for the prediction code.
- I also utilized scipy for statistical needs.
- I also went ahead with linear regression and pandas.

21st July 2023:
Read articles on Machine Learning.

- I firstly read about how machine learning impacts today's needs and how it is important in today's context.
- I also read about how industrial prediction is an important factor for predictive maintainence.
- I also learned about basic machine learning models

22nd July 2023:

Continued reading about Machine Learning.

- I read about predictive maintenance and its various components and also read about the various procedures for maintenance.
- Due to prior commitments, I was not able to work on today's work alot.

23rd July 2023:
Practiced on Wind Speed Prediction Dataset.

- I utilized numpy, pandas and matplotlib module in the code.
- I found out the various relations between different part of the dataset.
- I also used linear regression for the prediction.

marathonpredict.ipynb × cryptoprediction.ipynb

C: > Users > 91923 > Downloads > marathonpredict.ipynb > y = marathon_all['MarathonTime']

+ Code + Markdown | Run All Restart Clear All Outputs | Variables Outline ··· Python 3.9.7

```
MarathonTime   -0.629511   0.180594   0.969089   1.000000
```

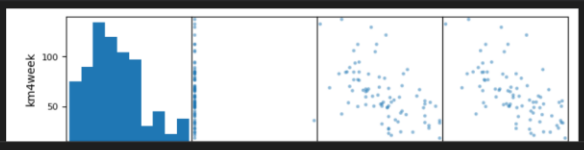
```
corr_matrix['MarathonTime'].sort_values(ascending=False)
```

[9] Python

```
MarathonTime    1.000000
Wall21          0.969089
sp4week         0.180594
km4week        -0.629511
Name: MarathonTime, dtype: float64
```

```
scatter_matrix(df,figsize=(8,8));
```

[10] Python



PROBLEMS OUTPUT TERMINAL JUPYTER SERIAL MONITOR DEBUG CONSOLE

Filter (e.g. text, **/*.ts, !*...

No problems have been detected in the workspace.

marathonpredict.ipynb cryptoprediction.ipynb ●

C: > Users > 91923 > Downloads > cryptoprediction.ipynb > data = pd.read_csv("C:\\Users\\91923\\Downloads\\12 (2) (Data).csv")

+ Code + Markdown | Run All Restart Clear All Outputs | Variables Outline ··· Python 3.9.7

```
               '2018-05-05', '2018-05-04'],
              dtype='datetime64[ns]', name='date', length=1334, freq=None)
```

```
train_data = data.iloc[200:]
test_data = data.iloc[:200]

def line_plot(line1, line2, label1=None, label2=None, title='', lw=2):
    fig, ax = plt.subplots(1, figsize=(13, 7))
    ax.plot(line1, label=label1, linewidth=lw)
    ax.plot(line2, label=label2, linewidth=lw)
    ax.set_ylabel('XRP/USDT', fontsize=14)
    ax.set_title(title, fontsize=16)
    ax.legend(loc='best', fontsize=16);
line_plot(train_data[aim], test_data[aim], 'training', 'test', title='')
```

[4] Python