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TO,
IITD-AIA Foundation of Smart Manufacturing

Subject: Weekly Progress Report for Week 4

Dear Sir,
During this week, I made progress in various areas of my internship. Here's a day-wise summary of my activities:

June 26:

- Completed the Exploratory Data Analysis (EDA) on the dataset.

- Engaged in reviewing relevant research papers on the topic of predicting wear and tear of tools in a lathe machine.

- Conducted data visualization of the provided datasets to identify proportionality and any ambiguities.

- The primary focus of the day was on performing EDA.

June 27:

- Completed Data Preprocessing on the dataset.

- Carried out box-plot analysis and removed outliers from the dataset.

- Started developing a Convolutional Neural Network (CNN) model from scratch.

- Gained knowledge about box-plot analysis and the process of building a CNN model from scratch.

- The day's work primarily revolved around data preprocessing and model development.

June 28:

- Continued working on the development of the CNN model from scratch.

- Explored Artificial Neural Networks (ANN) and gained understanding about its architecture and functionalities.

- The day's focus was on developing the CNN model and familiarizing myself with ANN.

June 29:

- Continued the development of the CNN model from scratch.

- Engaged in the implementation and refinement of the CNN model.

- Learned more about CNN and ANN models and their applications.

- Experienced challenges in developing the model, which required troubleshooting.

June 30:

- Continued the development of the CNN model from scratch.

- Engaged in the implementation and refinement of the CNN model.

- Learned more about CNN and ANN models and their applications.

- Experienced challenges in developing the model, which required troubleshooting.

July 1:

- Continued working on the development of the CNN model from scratch.
- Explored oversampling and undersampling techniques used to adjust class distribution in datasets.
- Focused on model development and incorporating oversampling and undersampling techniques.
- Encountered no major issues but faced a challenge in model development.

July 2:

- Performed oversampling on the dataset. Got errors and came to know that oversampling cannot be performed for regression techniques as it needs input that are "int" or continuous in general.

- Trained dataset on Linear and Extra Trees Regressor.

- Achieved an MSE of 0.660 for Extra Trees Regressor.

- Encountered no major issues.

Throughout the week, I actively worked on Exploratory Data Analysis, Data Preprocessing, and developing a CNN model from scratch and training our data on Linear and Extra Trees Regressor. I also dedicated time to review relevant research papers and enhance my knowledge in the specific domain. The incorporation of oversampling and undersampling techniques aimed to improve the class distribution in the dataset. On performing oversampling on the dataset I came to know that it cannot be performed for regression techniques.

There were no significant issues or closures during the week. As per the planned track, there was progress made, but there were also instances where progress deviated from the track. Overall, it was a week of continuous learning and advancement in the assigned tasks, with a focus on data analysis and model development.