Name: Daiya Jay Jograj
Enrollment No.: 221240107004 Email:
jaydaiya1512@gmail.com

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Assignment: Week 02

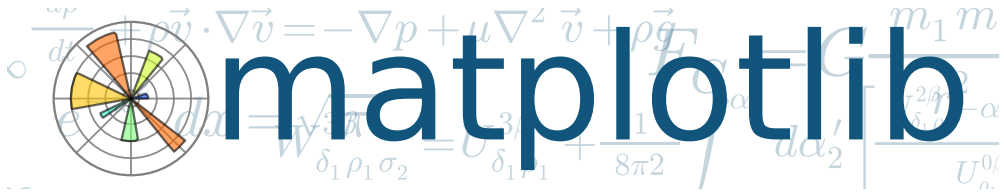
✞ Overview of most common 3 python libraries.

1. **TensorFlow**: It is a library used for machine learning and artificial intelligence. It helps in building and training models that can predict outcomes or analyse data. In manufacturing, TensorFlow can be used for quality control, predicting machine failures, or optimizing production processes. It is powerful because it can handle large amounts of data and work with complex algorithms.

- TensorFlow was developed by the Google Brain team for Google's internal use in research and production. The first version was released in 2015 under the Apache License 2.0, and an updated version, TensorFlow 2.0, was released in September 2019.
- It supports multiple programming languages like Python, JavaScript, C++, and Java, making it versatile for various applications across industries.
- TensorFlow uses data to train models. For example, you can feed it data about machine performance, and it will learn patterns to predict future failures.
- Supports deep learning for complex tasks like image recognition.

- Can be used for real-time data analysis in smart factories.

2. **Matplotlib:** It is a library for creating graphs and visualizations. It helps in turning data into easy-to-understand charts like line graphs, bar charts, or pie charts. In manufacturing, Matplotlib can be used to visualize production trends, compare machine performance, or analyse defects. It is simple to use and great for beginners.



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   - Matplotlib takes data and turns it into visual charts. You can plot data points on graphs to see trends or patterns.
   - Customizable graphs (colours, labels, styles).
   - Can create 3D plots for advanced analysis (e.g.: visualizing machine performance in 3D space).

3. **Seaborn:** It is another library for data visualization, built on top of Matplotlib. It makes creating attractive and detailed graphs easier. In manufacturing, Seaborn can be used to show relationships between variables, like how temperature affects product quality. It is especially useful for making complex data look simple & clear.

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- Seaborn integrates well with Pandas Data Frames, making it a popular choice for data scientists. It simplifies the creation of advanced plots like heatmaps, violin plots, and pair plots, which are useful for analysing relationships in data.
- In manufacturing, Seaborn can create a heatmap to show how different factors (like temperature, pressure, and humidity) affect product quality.
- Built-in themes for professional looking graphs.
- Can create statistical plots like violin plots or pair plots to analyse relationships between variables.