IDEATION PHASE

PROBLEM STATEMENTS

TEAM ID	**PNT2022TMID45954**
TEAM PROJECT TITLE	***Machine Learning-Based Predictive Analytics for Aircraft Engine***
DATE	***30 October 2022***

1. Problem Statement:

Engine failure is very dangerous and requires significant time for repair. Our first step is to identify the target variable which we want to predict. Since our dataset consists of sensor readings, it initially isn't intuitive as to what will help us arrive at our target variable. Through some analysis, we realized that based on the maximum number of cycles until failure, we can compute the Remaining useful life or RUL. After which we will approach predictive maintenance as a binary classification problem. Any equipment can have predictive maintenance and failure detection, but we'll be dealing with engine failure for a predetermined period of days.

2. Need of code for perfect results:

The problem can be posed as a regression or binary classification or multi-class classification for this dataset. In this case study, binary classification is done and the code predicts whether the Engine will fail in next 30 cycles or not. Class label 1 represents that it will fail in next 30 cycles and class label 0 represents that it won't. These labels are not given by dataset but are generated by code. As it is more important to correctly classify it as failure when it is going to fail, Recall is considered as the performance metrics in this case study.

3.Problem with Engines :

Preventable fuel problems such as exhaustion, mismanagement, contamination, or mis-fuel filling. Structural failures where a broken connecting rod, crank, valve, or camshaft is present account for seventeen percent of engine failures, primarily in Continental engines.

4.Problem with Human resources

It is better to record and maintain data and the malfunction with systems through machine learning with the Aid of Artificial Intelligence. But there is a need of Human resource for maintaining the datasets. There is such need of pilot and second officers are needed to maintain the Passengers. There is no one to worry about the condition of airplane, pilot concentration is fully focused on flight stability. There is no possibility to have a look on engines condition. So machine learning can help to read the data and predict the engine health.