**WEEK1: Classification**

This notebook demonstrates the development of a Classification Model in Python. It covers dataset handling, feature preprocessing, model training, evaluation, and interpretation of results. Where we understood what exactly is classification and its applications (e.g., spam detection, medical diagnosis, etc.) and the specific classification approach used (Logistic Regression, Decision Tree, or Random Forest).

1. **Data Loading & Cleaning**: Same as what was done in regression notebook the dataset is imported (CSV/Excel). Cleaning steps was also similar to theregression notebook one handling missing values, encoding categorical variables, standardizing/normalizing features.
2. **Exploratory Data Analysis (EDA)**: Here we can see the distribution plots of classes, Correlation analysis of features and visualizations using matplotlib. The difference I found between regression one and clasification one is the “classes” this one gives the output in the form of ‘classes’ while regression one gave the output in numerical term.
3. **Data Splitting**: Same as regression one where the dataset was divided into training and testing sets but here the class balance was checked (possibly with value\_counts or visual plots).
4. **Model Implementation**: The model was trained on differernt classification algorithm (LogisticRegression, RandomForestClassifier, DecisionTreeClassifier, etc.).
5. **Model Evaluation**: Predictions generated on test data which was similar to the regression one here the metrics were: Accuracy, Precision, Recall, F1-score, ROC-AUC, Confusion Matrix visualization, ROC curve plotted.

This notebook provides a clear and practical demonstration of classification modeling in Python. It effectively explains the methodology, demonstrates coding, and uses evaluation metrics. Where we learnt how different classification model varies in use-case as well as how it varies in their own type of limitations.