**Project Title: Predictive Analytics and Recommendation Systems in Banking**

**Objective:**

* Predict customer behavior to improve banking services.
* Common tasks:
  + Predict if a customer will subscribe to a term deposit (binary classification).
  + Identify potential loan defaulters (risk prediction).
  + Forecast customer churn (retention prediction).

**Dataset Used:**

* Public dataset (e.g., Bank Marketing dataset from UCI).
* Features include:
  + Account details (balance, credit, loans)
  + Contact info (communication type, last contact)
  + Campaign-related info (previous outcome, duration)

**Data Preprocessing:**

* Handling missing values.
* Encoding categorical variables (Label Encoding / One-Hot Encoding).
* Feature scaling (StandardScaler / MinMaxScaler).
* Train-test split.

**Exploratory Data Analysis (EDA):**

* Visualizations: Histograms, box plots, correlation heatmaps.
* Customer behavior insights:
  + Age group-wise response
  + Campaign success rate
  + Loan impact on subscription

**Model Selection:**

* Classification Models Used:
  + Logistic Regression
  + Decision Tree
  + Random Forest
  + XGBoost
  + Support Vector Machine (SVM)
* Evaluation Metrics:
  + Accuracy
  + Precision, Recall, F1-score
  + ROC-AUC Score
  + Confusion Matrix