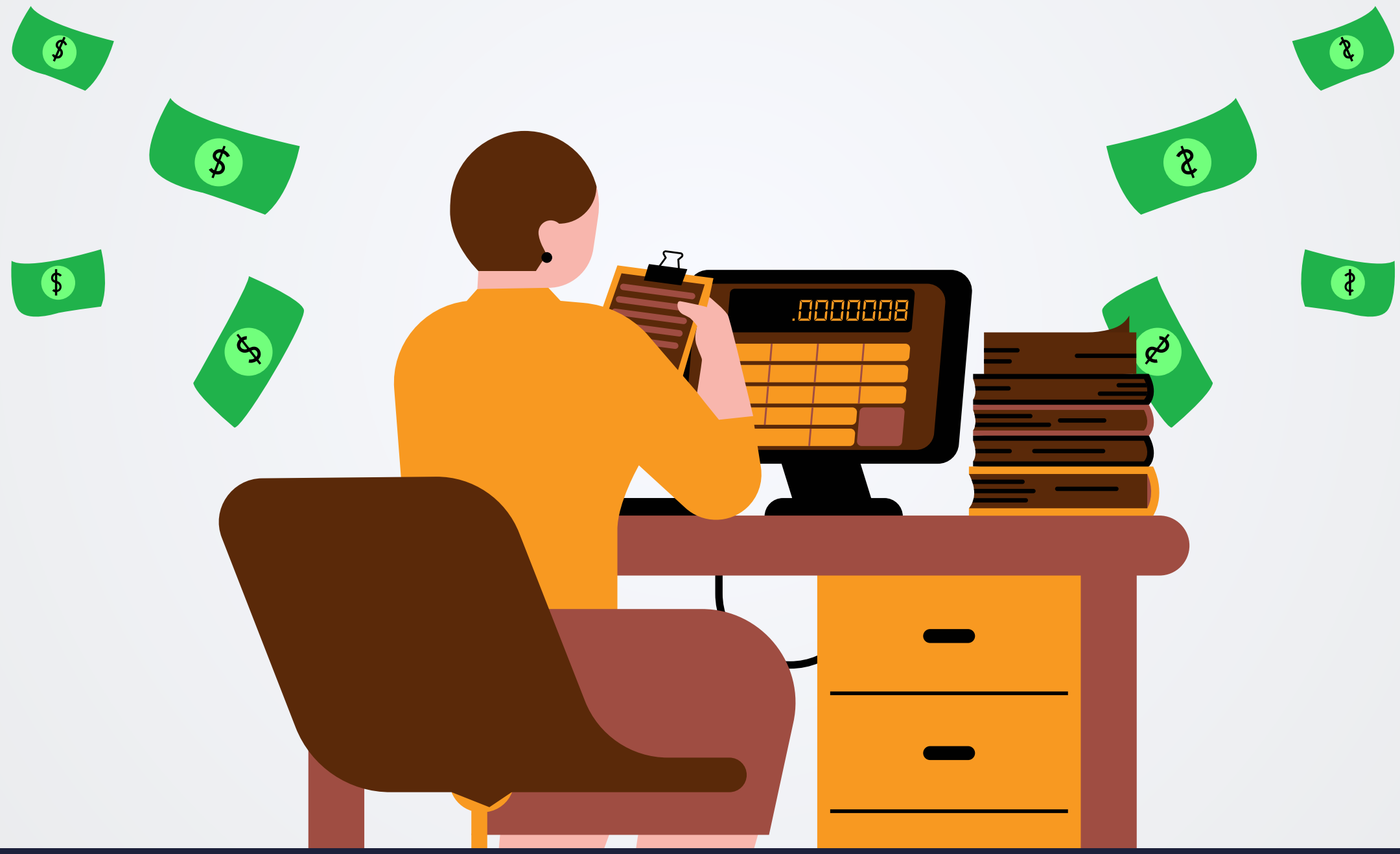
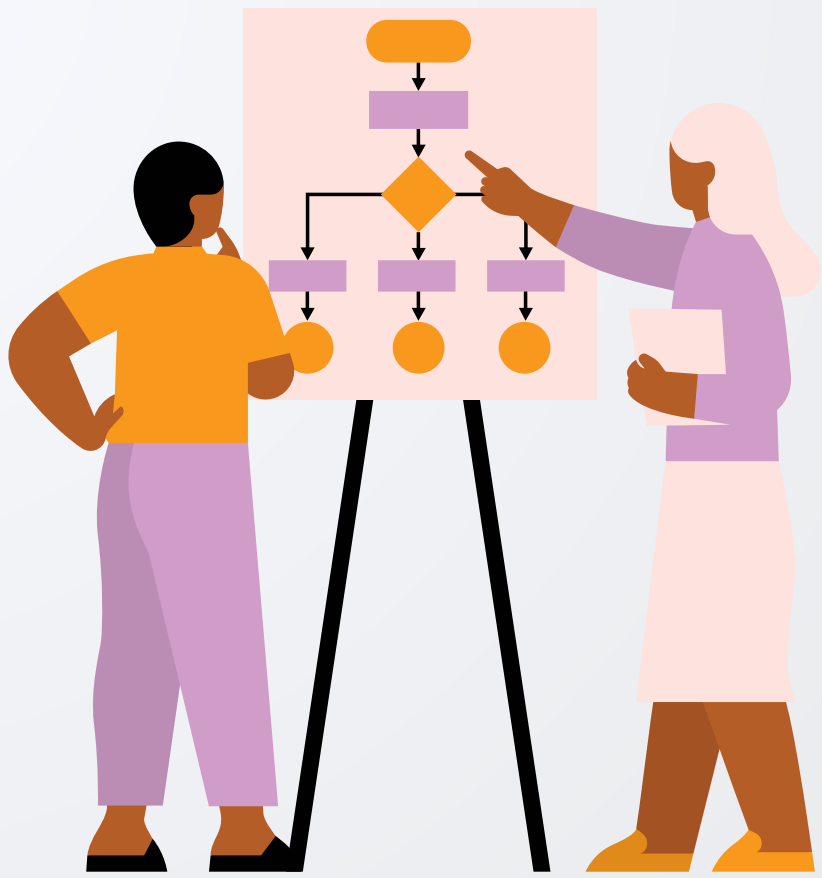
LOAN APPROVALL PREDICTION



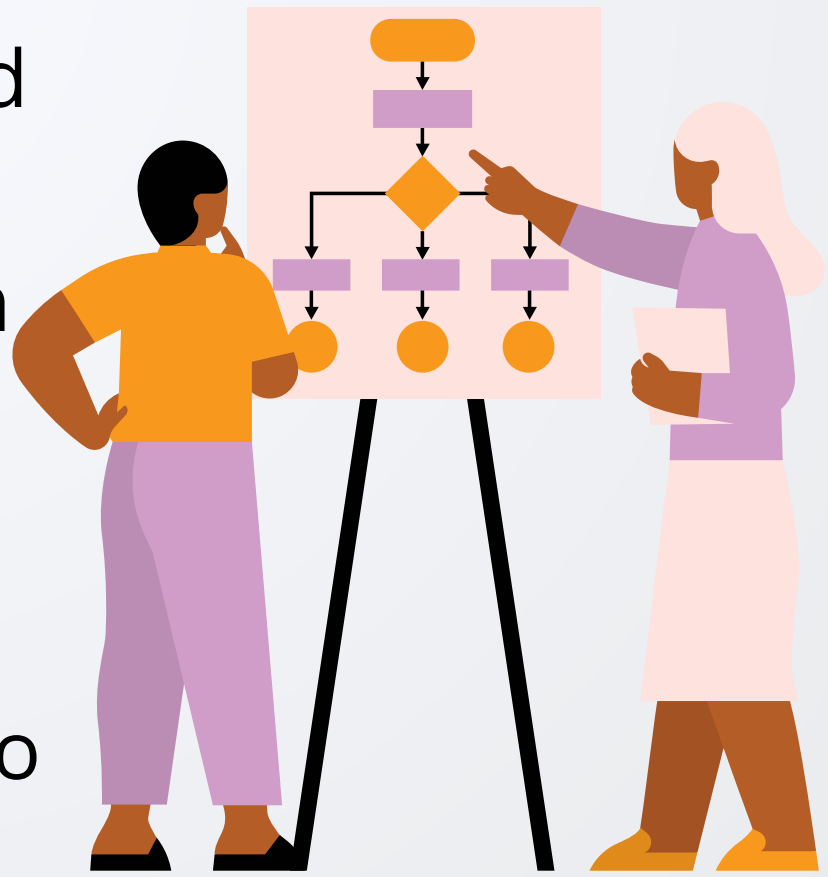
Loan Approval Prediction with Neural Network

Data Analysis & Model Evaluation
July 2025



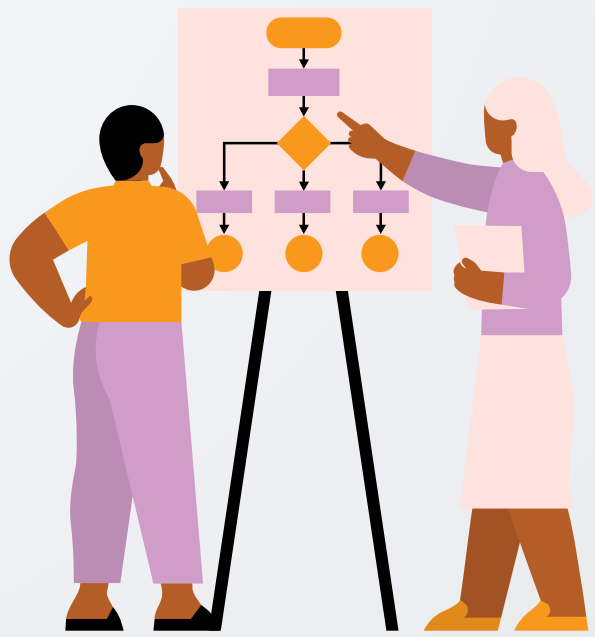
Problem Statement & Objective

- Predict whether a loan application is approved based on applicant information.
- Use a neural network to learn patterns in borrower & loan attributes.
- Goal: Improve prediction accuracy and gain insights into key factors.



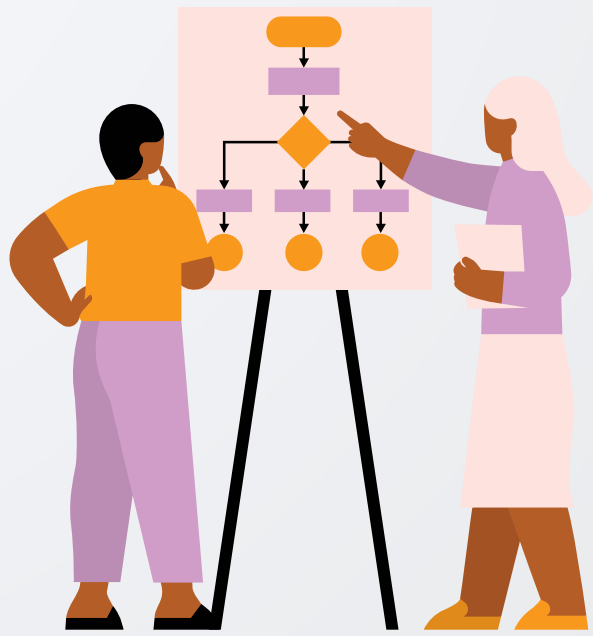
Dataset Overview

- Dataset: LoanApprovalPrediction.csv
- Features:
- Gender, Married, Education, ApplicantIncome, CoapplicantIncome, LoanAmount, Credit_History, Property_Area
- Target: Loan_Status (0 = Not Approved, 1 = Approved)
- Preprocessing:
- Missing values imputed
- Categorical variables encoded
- Numerical features standardized



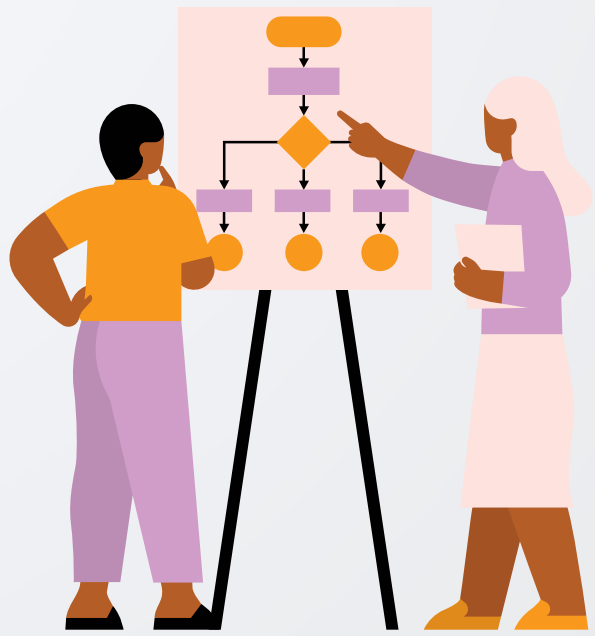
Exploratory Data Analysis (EDA)

- Class imbalance: More approved than rejected loans.
- Credit history strongly correlated with loan approval.
- Higher income & loan amount slightly associated with approval.
- No extreme outliers after cleaning.



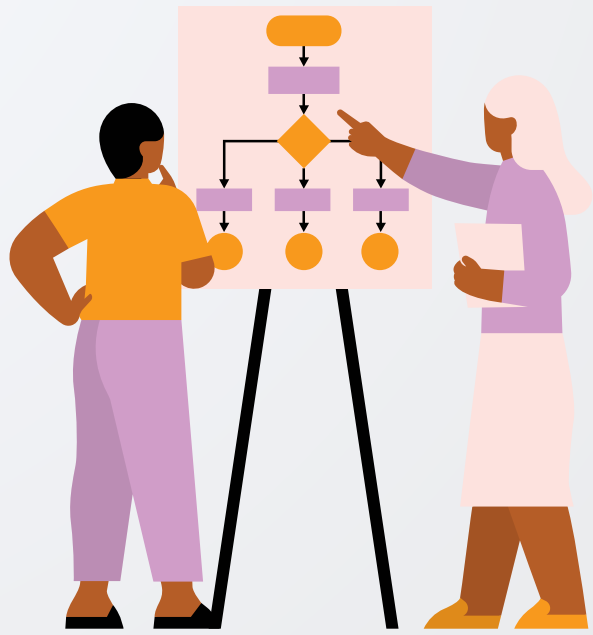
Neural Network Architecture

- Input: borrower & loan features.
- Hidden Layers:
- 64 neurons (ReLU) + Dropout
- 32 neurons (ReLU)
- Output Layer: 1 neuron (Sigmoid) → binary prediction
- Loss: Binary Crossentropy
- Optimizer: Adam



Evaluation Metrics

- Confusion Matrix:
- True Positives / True Negatives / False Positives / False Negatives
- Classification Report:
- Precision, Recall, F1-Score
- Test set accuracy: [insert value from your notebook]



Conclusions & Recommendations

- Neural network effectively predicts loan approval.
- Credit history & income are key predictors.

Future improvements:

- More data
- Hyperparameter tuning
- Try deeper or alternative architectures (like XGBoost)