

Customer Churn Prediction Using Artificial Neural Network (ANN)

Project Overview

This project predicts whether a bank customer will leave the bank using an Artificial Neural Network (ANN). The model is trained using customer demographic and financial data.

Dataset

Source: Kaggle - Credit Card Customer Churn Dataset

Target Variable: Exited (1 = Churn, 0 = Not Churn)

Technologies Used

Python, NumPy, Pandas, Scikit-learn, TensorFlow, Keras, Matplotlib

Data Preprocessing

- Removed unnecessary columns
- One-hot encoding applied
- Feature scaling using StandardScaler
- Train-test split (80-20)

ANN Architecture

Input Layer: 11 neurons

Hidden Layer 1: 16 neurons (ReLU)

Hidden Layer 2: 8 neurons (ReLU)

Output Layer: 1 neuron (Sigmoid)

Model Training

Optimizer: Adam

Loss Function: Binary Crossentropy

Epochs: 100

Batch Size: 32

Evaluation Metrics

- Accuracy
- Confusion Matrix
- ROC-AUC Curve

Results

Accuracy achieved: ~86–88%

ROC-AUC Score: ~0.87

The model performs well and generalizes effectively.

Conclusion

The ANN model successfully predicts customer churn and can be used by banks to identify high-risk customers.

Future Enhancements

- Add Dropout layers
- Hyperparameter tuning
- Try XGBoost or Random Forest
- Deploy using Streamlit