Model Validation Report

# Executive Summary

The submitted model was validated using an independent validation framework. Performance metrics fall below the expected thresholds. Several flags were raised in fairness and drift checks. Final recommendation: Needs developer action before approval.

# Input Summary

Model File: model.pkl

Cleaned Data File: cleaned\_data.csv

Raw Data File: raw\_data.csv

Rules File: rules.yaml

Target Column: default

Validation Mode: Independent (Mode 1)

# Model Metadata

Model Type: LogisticRegression

Feature Count: 10

Feature Names: ['loan\_amnt', 'income', 'emp\_length', 'credit\_score', 'open\_acc', 'dti', 'age', 'revol\_util', 'term']

Training Rows: 700

Target Balance: {1: 350, 0: 350}

Library: sklearn.linear\_model

Model Version: 1.4.2

# Data Summary

Cleaned Data:

- Missing %: 0.0

- Constant Columns: []

- Duplicate Rows: 0

Raw Data:

- Rows: 1001, Columns: 11

- Average Missing: 0.0

- Constant Columns: ['constant\_col']

# Train-Test Split Details

- Strategy: Random Split

- Split Ratio: 80/20

- Training Rows: 700

- Test Rows: 300

# Performance Metrics

- Accuracy: 0.4767

- AUC: 0.4763

- F1 Score: 0.4886

- KS Statistic: Invalid (only one unique score)

- Confusion Matrix: [[68, 82], [75, 75]]

# Drift Detection

Drifted Columns: ['income', 'credit\_score']

PSI:

- income: 0.25

- credit\_score: 0.32

# SHAP Explainability

SHAP graph to be inserted here.

Top Features: ['credit\_score', 'income', 'dti', 'age']

Over-reliant Feature: age (45%)

A graph of a graph with text

AI-generated content may be incorrect.

# Fairness Evaluation

- AUC (Male): 0.49

- AUC (Female): 0.46

- Disparity: 0.03

# Rule Engine Results

Overall Result: Fail

Rules Evaluated:

- AUC: 0.4763 (Minimum expected: 0.7)

- KS: Invalid (Minimum expected: 0.1)

# - F1: 0.4886 (Minimum expected: 0.6)

- Dev Data Shape: (1000, 10)

- Validator Data Shape: (1000, 10)

- Same Shape: True

- Extra Columns in Developer Data: []

- Missing Columns in Developer Data: []

- Cell Mismatches: 0

# Environment Metadata

- Validation Date: 2025-06-05

- Validator Version: tanml v1.2.0

- Python Version: 3.10

- OS: Ubuntu 20.04 (Docker)

# Warnings and Exceptions

- KS not computed due to uniform predictions

# Final Recommendation

The model does not meet required performance thresholds and exhibits signs of feature over-reliance. Developer should improve feature stability and retrain. Not approved for deployment in current form.