# SHAP (SHapley Additive exPlanations) Feature Attribution [SYNTHETIC DATA]
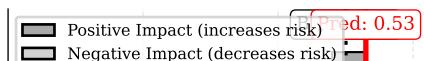
## SHAP Waterfall Chart: Feature Contributions

## Feature Importance Ranking



Left panel (Waterfall chart, Model Output):
- Num. Credit Cards: +0.050
- Age: +0.080
- Employment Years: +0.120
- Loan Amount: -0.150
- Credit Score: +0.180
- Debt-to-Income: -0.220
- Income: +0.250
- Previous Defaults: -0.280

Legend:
- Positive Impact (increases risk)
- Negative Impact (decreases risk)

Predicted: 0.53

X-axis: Model Output

Right panel (Feature Importance Ranking, |SHAP Value|):
- Num. Credit Cards: 0.050
- Age: 0.080
- Employment Years: 0.120
- Loan Amount: 0.150
- Credit Score: 0.180
- Debt-to-Income: 0.220
- Income: 0.250
- Previous Defaults: 0.280

X-axis: |SHAP Value| (Feature Importance)

Interpretation:
- Previous Defaults: Strong negative impact (reduces default probability)
- Income: Strong positive impact (increases approval likelihood)
- Debt-to-Income: Negative impact (higher ratio = higher risk)
- SHAP values show how each feature pushes prediction away from base value