Drop-Column Importance

Feature Removal Impact Analysis

Importance Score Comparison

Feature	Permutation	Drop-Column	Δ Diff
Credit Score	0.085	0.092	+0.007
Income	0.072	0.078	+0.006
Age	0.065	0.048	-0.017
Debt Ratio	0.058	0.061	+0.003
Employment	0.048	0.032	-0.016
Education	0.042	0.044	+0.002
Experience	0.035	0.036	+0.001
Savings	0.028	0.028	0.000

Method

Process

1. Train with all features
2. Remove one feature
3. Retrain model
4. Measure performance drop

Accuracy

More accurate than permutation

Cost

Requires n retrainings for n features

Correlations

Handles feature correlations better

Use Case

Final feature selection decisions

Key Insight

Fast | Accurate

Highlighted rows show redundant features

Calculation Example

BASELINE All Features Model

Credit Score | Income | Age | Debt Ratio

Accuracy **85.0%**

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STEP 2 Remove "Age" Feature

Credit Score | Income | ~~Age~~ | Debt Ratio

New Accuracy **80.2%**

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RESULT Importance Score

Drop-Column Importance = 85.0% - 80.2%

Age Importance: **4.8%**

Interpretation: Removing "Age" causes a 4.8% drop in accuracy, indicating it's a moderately important feature. Compare this across all features to identify which ones are truly essential for your model. Features showing lower importance in Drop-Column than Permutation (like Age: -0.017) might be redundant when other correlated features are present.