

Sparse Linear Models

L1 Regularization for Feature Selection

Dense Model

Standard Linear Regression

Age	0.72
Income	0.58
Credit	0.51
Debt	-0.48
Educ.	0.32
Exp.	0.23
Region	0.15
Gender	-0.09

Non-zero
8

Features
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Sparse Model

Lasso (L1 Regularization)

Age	0.68
Income	0.61
Credit	0.54
Debt	-0.45
Educ.	—
Exp.	—
Region	—
Gender	—

Non-zero
4

Features
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Benefits

Auto Selection

Only relevant features retained

Interpretability

Reduced feature count

Implementation

Easier to deploy and debug

High-Dim

Valuable when $p >> n$

Regularization

L1 (Lasso): Sparsity

L2 (Ridge): Stability

Elastic Net: Balanced