All measure metric for Regression Model

Key Terms and Formulas

- y_i = actual (observed) value for the i-th observation
- $\hat{y}_i$ = predicted value from the model for the i-th observation
- $\bar{y}$ = mean of all actual y values
- **n** = number of observations
- **p** = number of predictors (independent variables) + 1 (for the intercept)

METRIC	FULL NAME	FORMULA.	WHAT IT MEASURES	UNITS	INTERPRETATI / USE CASE
RSS	Residual Sum of Squares	RSS = $\Sigma (y_i - \hat{y}_i)^2$	Total squared error between actual and predicted values	Same as y^2	Raw measure of tota error. Lower = bette fit. Basis for many ot metrics.
TSS	Total Sum of Squares	TSS = $\Sigma (y_i - \bar{y})^2$	Total variability in the dependent variable (around its mean)	Same as y^2	Represents total variation in data. Us as denominator in R²
ESS / **SSR**	Explained / Regression Sum of Squares	SSR =. $\Sigma (\hat{y}_i - \bar{y})^2$	Amount of variability explained by the model	Same as y^2	Higher = model explains more variati TSS = SSR + RSS (always true).
MSE	Mean Squared Error	MSE = RSS / n or sometimes MSE = RSS / (n − p) (unbiased version)	Average squared error per observation	Same as y^2	Popular in machine learning. Lower = better. Penalizes larg errors heavily.
RSE / **RMSE**	Residual Standard Error / Root Mean Squared Error	RSE = √(RSS / (n − p)) RMSE = √(MSE) = √(RSS / n)	Square root of MSE — "typical" size of prediction error	Same as y	Most interpretable er metric (same units a y). Lower = better predictions.

METRIC	FULL NAME	FORMULA.	WHAT IT MEASURES	UNITS	INTERPRETATI / USE CASE
MAE	Mean Absolute Error	MAE = (1/n) Σ	$y_i - \hat{y}_i$		Average absolute err