The scoring parameter of cross_val_score

1) Regression Metrics

SN	Scoring	Meaning	When to use
1	r2	Coefficient of determination	Default regression metric
2	explained_variance	Variance explained by model	Similar to R^2, ignores bias
3	neg_mean_squared_error	Mean Squared Error (MSE)	Penalizes large errors
4	neg_root_mean_squared_error	RMSE	Error in original unit
5	neg_mean_absolute_error	MAE	Robust to outliers
6	neg_mean_absolute_percentage_error	MAPE	Percentage error interpretation
7	neg_median_absolute_error	Median absolute error	Highly robust to outliers
8	neg_mean_squared_log_error	MSLE	Growth-rate type data
9	neg_root_mean_squared_log_error	RMSLE	Skewed targets
10	neg_max_error	Maximum error	Worst-case analysis
11	neg_mean_poisson_deviance	Poisson deviance	Count data
12	neg_mean_gamma_deviance	Gamma deviance	Positive continuous data
13	d2_absolute_error_score	D^2 based on MAE	Model comparison metric

2) Basic Classification Metrics

SN	Scoring	Meaning	When to use
1	accuracy	Overall correctness	Balanced classes
2	balanced_accuracy	Avg recall per class	Imbalanced datasets
3	precision	TP / (TP + FP)	FP costly
4	recall	TP / (TP + FN)	FN costly
5	f1	Harmonic mean of P & R	Precision–recall tradeoff
6	matthews_corrcoef	Correlation-based score	Best for imbalance

3) Averaging Variants (Multiclass / Imbalanced)

SN	Scoring	Meaning	When to use
1	precision_micro	Global precision	Class imbalance
2	precision_macro	Unweighted mean	All classes equal
3	precision_weighted	Weighted by class size	Imbalanced data
4	precision_samples	Sample-wise precision	Multi-label
5	recall_micro	Global recall	Imbalanced data
6	recall_macro	Avg recall per class	Fairness
7	recall_weighted	Weighted recall	Class imbalance
8	recall_samples	Sample-based recall	Multi-label
9	f1_micro	Global F1	Many small classes
10	f1_macro	Mean F1	Class equality
11	f1_weighted	Weighted F1	Practical imbalance
12	f1_samples	Sample-based F1	Multi-label

4) ROC–AUC Metrics (Probability-based)

SN	Scoring	Meaning	When to use
1	roc_auc	Binary ROC–AUC	Probabilistic models
2	roc_auc_ovr	One-vs-rest AUC	Multiclass
3	roc_auc_ovo	One-vs-one AUC	Multiclass
4	roc_auc_ovr_weighted	Weighted OVR	Class imbalance
5	roc_auc_ovo_weighted	Weighted OVO	Unequal classes

5) Ranking & Recommendation Metrics

SN	Scoring		When to use
1	average_precision		Imbalanced ranking problems
2	top_k_accuracy		Recommendation systems

6) Jaccard Metrics (Multi-label / Set Similarity)

SN	Scoring		When to use
1	jaccard		Binary / multilabel
2	jaccard_micro		Global similarity
3	jaccard_macro		Per-class equality
4	jaccard_weighted		Imbalanced classes
5	jaccard_samples		Sample-wise

7) Clustering Metrics (Unsupervised)

SN	Scoring	Meaning	
1	adjusted_rand_score	Label agreement	
2	rand_score	Raw cluster agreement	
3	mutual_info_score	Shared information	
4	normalized_mutual_info_score	Normalized MI	
5	adjusted_mutual_info_score	Chance-adjusted MI	
6	homogeneity_score	Each cluster = one class	
7	completeness_score	All class members in cluster	
8	v_measure_score	Harmonic mean of above	
9	fowlkes_mallows_score	Precision–recall tradeoff	

8) Probabilistic & Calibration Metrics

SN	Scoring		When to use
1	neg_log_loss		Penalize confident wrong predictions
2	neg_brier_score		Probability calibration
3	positive_likelihood_ratio		Medical diagnostics
4	neg_negative_likelihood_ratio		Diagnostic tests