

Logistic Regression Hyperparameters

➤ Key Logistic Regression Hyperparameters

1. **C (Inverse Regularization Strength)**

1. Controls **amount of regularization**.
2. **Small C** → strong regularization (simpler model, less overfitting).
3. **Large C** → weak regularization (more complex model, risk of overfitting).
4. Default: 1.0.

2. **penalty (Type of Regularization)**

1. "l2" → Ridge-like (default for most solvers).
2. "l1" → Lasso-like (feature selection).
3. "elasticnet" → mix of L1 & L2.
4. "none" → no regularization.

3. **solver (Optimization Algorithm)**

1. "liblinear" → good for small datasets, supports L1/L2.
2. "lbfgs" → efficient for large datasets, supports L2.
3. "saga" → supports L1, L2, ElasticNet, and large-scale data.
4. "newton-cg" → L2 only, can handle large datasets.

4. **max_iter (Maximum Iterations)**

1. Stops training if convergence is reached.
2. Increase if the model fails to converge.

5. **class_weight**

1. "balanced" → adjusts weights inversely to class frequencies (useful for imbalanced datasets).
2. Default: None.

➤ Tuning Tips

- Use **GridSearchCV** or **RandomizedSearchCV** for systematic tuning.
 - Start with default values, adjust **C** first, then **solver**, then **penalty**.
 - Monitor both **accuracy** and **precision/recall** for imbalanced datasets.
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