

LightGBM (Light Gradient Boosting Machine)

1 Why LightGBM was created?

XGBoost is powerful but:

- Slow on very large datasets
- High memory usage

LightGBM focuses on **speed and scalability**.

Side-by-side comparison

Feature	XGBoost	LightGBM
Speed	Fast	Very fast
Memory	High	Low
Tree growth	Level-wise	Leaf-wise
Overfitting	Less	Needs tuning
Large data	Good	Excellent

Which one should YOU use?

Use XGBoost when:

- ✓ Dataset is small–medium
 - ✓ Accuracy is top priority
 - ✓ You want strong regularization
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Use LightGBM when:

- ✓ Dataset is huge
- ✓ Training speed matters
- ✓ Memory is limited