

# LightGBM (Light Gradient Boosting Machine)

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## 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	<b>Very fast</b>
Memory	High	<b>Low</b>
Tree growth	Level-wise	<b>Leaf-wise</b>
Overfitting	Less	Needs tuning
Large data	Good	<b>Excellent</b>

## 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