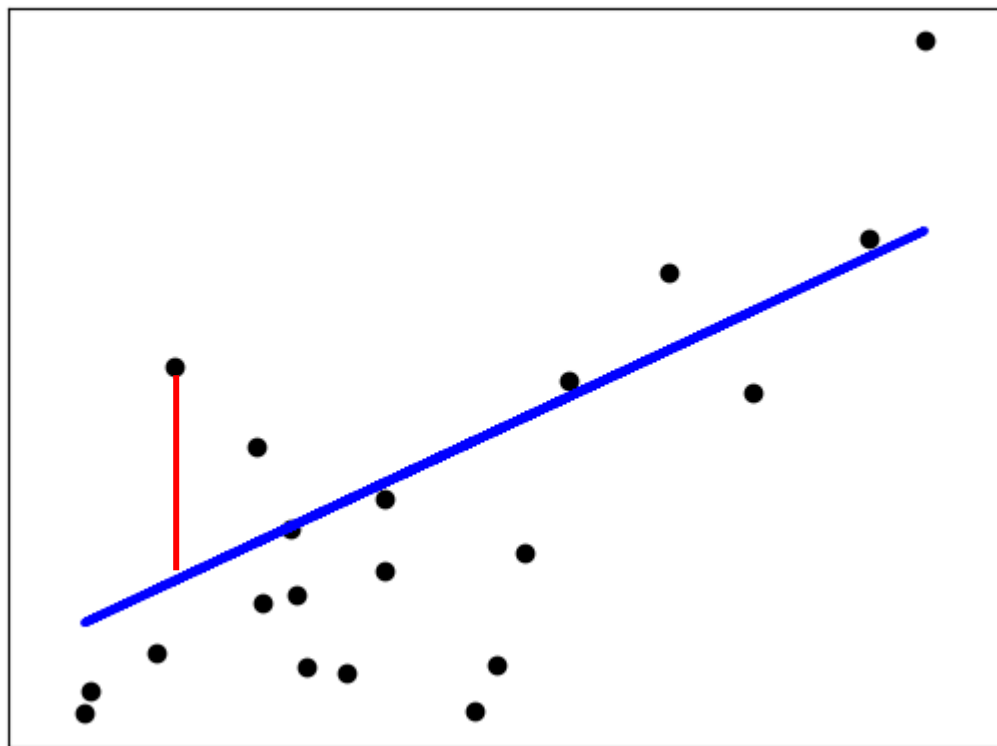


Regression Error Metrics

Regression Error Metrics

- Mean Absolute Error (MAE): $\frac{1}{n} \sum_{i=1}^n |y_i - \hat{y}_i|$
- Mean Squared Error (MSE): $\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2$
- Root Mean Squared Error (RMSE): $\sqrt{\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2}$

Regression Error Metrics



$$\text{MAE: } \frac{1}{n} \sum_{i=1}^n |y_i - \hat{y}_i|$$

$$\text{MSE: } \frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2$$

$$\text{RMSE: } \sqrt{\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2}$$

Example

- Ground truth: 100, 120, 110
- Predictions: 105, 120, 120
- MAE: $(|100-105| + |120-120| + |110-120|) / 3 = 15 / 3 = 5$
- MSE: $((100-105)^2 + (120-120)^2 + (110-120)^2) / 3 = 125 / 3 \approx 42$
- RMSE: $\text{root}(\text{MSE}) = \text{root}(42) \approx 6.5$
- Compare with:
- Ground truth mean: $(100 + 120 + 110) / 3 = 110$
- Ground truth standard deviation: 10

$$\text{MAE: } \frac{1}{n} \sum_{i=1}^n |y_i - \hat{y}_i|$$

$$\text{MSE: } \frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2$$

$$\text{RMSE: } \sqrt{\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2}$$