F1 Score and Fβ

F1 Score

Harmonic Mean

$$F1 = 2 \times P \times R / (P + R)$$

Balances Precision & Recall

- Single metric (0 to 1)
- Equal weight to P and R
- Penalizes extreme values
- Use when balance needed

Fβ Score

Weighted F-Score

$$F\beta = (1+\beta^2) \times P \times R / (\beta^2 P + R)$$

Allows emphasis control

- β controls weight
- β > 1: Favor recall
- β < 1: Favor precision
- β = 1: Standard F1

β Parameter Spectrum

F0.5	**F1**	**F2**
β = 0.5	β = 1	β = 2
Emphasizes Precision	Balanced	Emphasizes Recall

Common Fβ Variants

F0.5	**F1**	**F2**
Precision > Recall	Precision = Recall	Recall > Precision
Minimize false alarms	*Equal importance*	*Minimize misses*