

## 5. Normalizer

### How it works:

Transforms each row (or sample) so that its **norm** (length) becomes 1.

### Steps:

#### 1. Calculate the norm of the vector $x$ :

For L2 normalization:

$$\|x\|_2 = \sqrt{x_1^2 + x_2^2 + \dots + x_n^2}$$

#### 2. Normalize each element of the vector:

For every  $x_i$ :

$$x'_i = \frac{x_i}{\|x\|_2}$$

**Use Case:** When you need to normalize rows independently, such as in text classification or clustering.