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### 0.1 Matrix rank

#### 0.1.1 Rank function

The rank of a matrix is the dimension of the span of its component columns.

$$\text{rank}(M) = \text{span}(m_1, m_2, \dots, m_n)$$

#### 0.1.2 Column and row span

The span of the rows is the same as the span of the columns.