

## MATRIX PERMANENTS

## Why

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## Definition

The permanent of a matrix  $A \in \mathbb{R}^{n \times m}$  is

$$\sum_{\sigma \in S_n} \prod_{i=1}^n A_{i,\sigma(i)}$$

where  $S_n$  is the symmetric group of degree n (see Permutations).

## **Notation**

We denote the permanent of A by perm(A).

<sup>&</sup>lt;sup>1</sup>Future editions will include. The reasoning is that several counting problems to do with graphs reduce to permanents of the adjacency matrix.

