Visual Formula for Determinants

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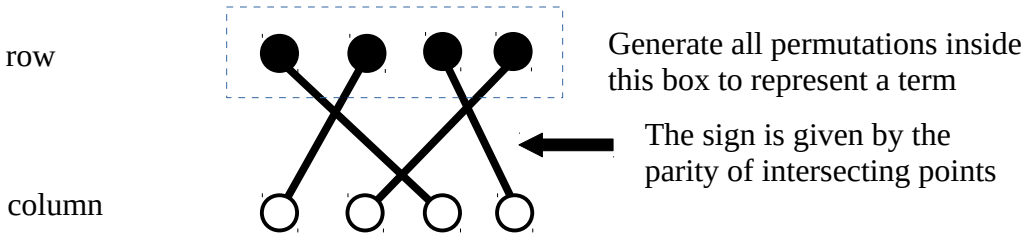
In this paper I present a visual formula for matrix determinants, using permutative path semantics.

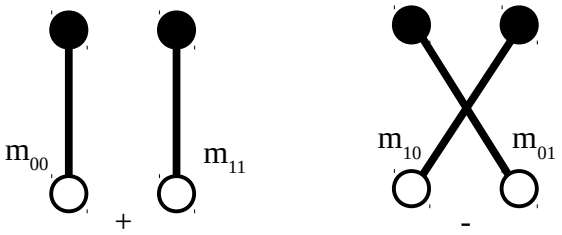
A determinant is a scalar value that can be computed from the elements of a square matrix.

Here is a visual version of the formula for determinants:



An even parity of intersecting points is `+` and odd parity is `-`.

For example, a matrix `m` of size `2 × 2`, has two permutations:



The first term has zero intersections, which is parity even.
The second term has one intersection, which is parity odd.

The formula for the determinant is given as following:

$$m_{00} \cdot m_{11} - m_{10} \cdot m_{01}$$