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0.1 Matrix additon and multiplication

0.1.1 Matrix multiplication

$A = A^{mn}$

$B = B^{no}$

$C = C^{mo} = A.B$

$c_{ij} = \sum_{r=1}^{n} a_{ir} b_{rj}$

Matrix multiplication depends on the order. Unlike for real numbers,

$AB \neq BA$

Matrix multiplication is not defined unless the condition above on dimensions is met.

A matrix multiplied by the identity matrix returns the original matrix.

For matrix $M = M^{mn}$

$M = MI^m = I^n M$

0.1.2 Matrix addition

2 matricies of the same size, that is with idental dimensions, can be added together.

If we have 2 matrices A^{mn} and B^{mn}

$C = A + B$

$c_{ij} = a_{ij} + b_{ij}$

An empty matrix with 0s of the same size as the other matrix is the identity matrix for addition.

0.1.3 Scalar multiplication

A matrix can be multiplied by a scalar. Every element in the matrix is multiplied by this.

$B = cA$

$b_{ij} = ca_{ij}$

The scalar 1 is the identity scalar.