Algorithms and data structures 5: Matricies-2 (end of lection)

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When solution exists?: rank

Lets multiply m-row by n-column, we get $M(m, n, R)$ matrix. This is rank 1 matrix.

Def: Tensor rank — minimum number of rank 1 matricies to sum.

Def: Column/Row rank — number of linear independent columns/rows.

($v_1, \ldots, v_n$ are linear dependent if $v_1 \in < v_2, \ldots, v_n >$)

Both defs are equal in case of $\mathbb{R}$..

- We need $rkA = n$

When solution exists?: det

Def: Invariant up to primitive operations

Def: (Minor definition)

And both defs are equal.

- We need $\det A \neq 0$.

Strassen matrix multiply

Summary

- Different parts of maths operate similar constructions
- This can be encapsulated in matrix theory
- We defined several operations on matricies
- Also we defined one decomposition

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