

Infinity numbers & Linsol

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Introduction



The project is separated in two parts:

- Infinite numbers
- Linsol(linear solver \rightarrow simplex)



Infinite numbers

Defifition

Infinity number is a pair of real numbers. The one if for the real part and the other is for the infinity part.

$$(a; b) = a + b\infty, \text{ where } a \in \mathbb{R}, b \in \{-1, 0, 1\}$$

Infinite numbers

Comparison

- If the infinity part of the number is > 1 the number is $= \infty$
- If the infinity part of the number is > -1 the number is $= -\infty$
- $\infty = \infty$ and $-\infty = -\infty$
- If the infinity parts of the both numbers are $=0$ then we compare the real parts as normal \mathbb{R}

Note: If the infinity part of the number $\notin \{-1, 0, 1\}$ we get it to one of these values

Infinite numbers

Math operations

$$(a; b) \pm (c; d) = (a \pm b; c \pm d)$$

$$(a; b) \times (c; d) = (ab; ac + bc + bd)$$

$$\frac{(a; b)}{(c; d)} = \begin{cases} (\frac{b}{d}; 0) & d \neq 0 \\ (\frac{a}{c}; \frac{b}{c}) & d = 0 \end{cases}$$

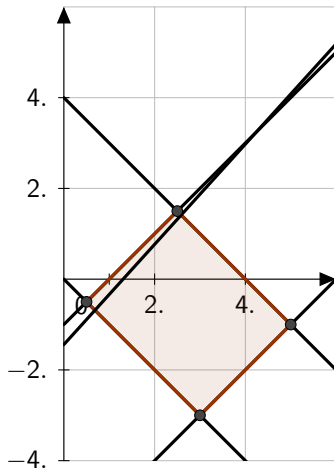
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Simplex

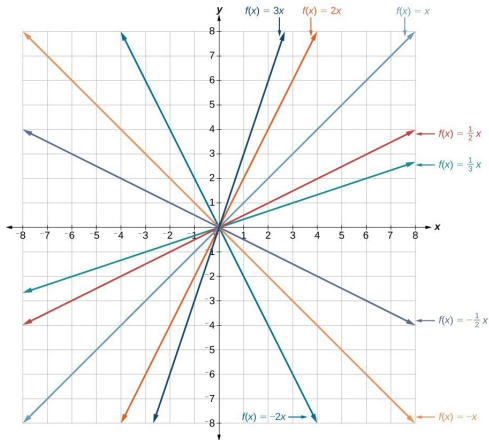
Definition

The simplex method is an algorithm for finding minimum/maximum value of a linear function with given linear constraints.

- Finds the figure of intersection of the graphics of the constraints.
- Loop all of the vertices and find where the target function's value is optimal



Linsol is a library written in Rust, which implements the simplex algorithm.





Code: <https://github.com/Ro6afF/linsol>

- Clarify the conception of the infinity numbers
- Make the code working
- Improve the memory consumption
- Improve the speed
- Implement integer solving

{code}YOURFUTURE

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- *Rust compiler toolchain*: <https://www.rust-lang.org>.
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Questions





THANK YOU
for your
ATTENTION!