Invited Lecture:
A survey of Integer Relations algorithms and rational numbers

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Abstract
It is widely believed that Integer Relations algorithms such as LLL, Lattice reduction or PSLQ which are implemented in most computer algebra systems are generalizations of the Euclidian algorithm or the continued fraction algorithm.

We give simple examples of cases where the programs fails to find a solution and in general examples of problem that could hardly be solved using such tools.

Most of the examples are either large rational numbers or near rational numbers, the difference being so small that even very high precision do not guarantee to have results.

Key words: Pisot sequences, Golden ratio, Zeolites, Coordination sequences, Algebraic numbers, LLL, PSLQ, Integer Relations, Lattice Reduction.

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