

CoCoALib - Feature #1482

Extended rationals: PlusInfinity and MinusInfinity

31 Aug 2020 13:56 - John Abbott

Status:	In Progress	Start date:	31 Aug 2020
Priority:	Normal	Due date:	
Assignee:		% Done:	10%
Category:	New Function	Estimated time:	0.00 hour
Target version:	CoCoALib-0.99900	Spent time:	1.30 hour
Description			
Might we be interested in having representations of PlusInfinity and MinusInfinity ?			
This could be useful for non-finite intervals. A possible representation could be as the "malformed" rationals 1/0 and -1/0.			
Related issues:			
Related to CoCoALib - Feature #1176: interval arithmetic		In Progress	05 Apr 2018

History

#1 - 31 Aug 2020 13:56 - John Abbott

- Related to Feature #1176: interval arithmetic added

#2 - 31 Aug 2020 14:02 - John Abbott

Some notes:

- what type should these values have? **BigRat**? Or Maybe **ExtendedBigRat**?
- We'd probably need functions such as `IsInfinite`
- Which operations should work on infinite values? `Sign`? `Comparisons`?
- Is `PlusInfinity == PlusInfinity`?
- What about arithmetic? Some operations could reasonably be defined: e.g. `finite + PlusInfinity` should give `PlusInfinity`, etc.

It may not be worth it. It could be tricky/tedious putting in all the checks to handle infinities in comparisons, and arithmetic operations...

#3 - 31 Aug 2020 14:48 - John Abbott

- Status changed from *New* to *In Progress*

- % Done changed from 0 to 10

The doc for GMP states fairly clearly that the rationals 1/0 and -1/0 can be created, but that they may not be passed to arithmetic functions. It is not clear whether they may be used safely in comparison functions; probably we should assume that it is not safe.

#4 - 31 Aug 2020 14:56 - John Abbott

Maybe the simple approach is to create two new types: **PlusInfinityType** and **MinusInfinityType**. Then it should be easy to write the special case functions: e.g. `PlusInfinityType operator+(const BigRat&, PlusInfinityType)`

Uniform handling inside the interval code might be rather tedious... :-(

#5 - 16 Feb 2024 18:02 - John Abbott

- Target version changed from CoCoALib-0.99850 to CoCoALib-0.99900