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 **MinusInfinty**?				
This could be useful for non-finite intervals. A possible represemtation 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 coul 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 casee 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