CoCoALib - Bug #111

Mod fn for computing remainder

20 Mar 2012 16:03 - John Abbott

Status:	Closed		**Start date:**	20 Mar 2012
Priority:	Normal		**Due date:**	
Assignee:	John Abbott		**% Done:**	100%
Category:	Documentation		**Estimated time:**	0.76 hour
Target version:	CoCoALib-0.99850		**Spent time:**	0.75 hour

Description

The doc says the result is least non-neg remainder...
BUT the code uses mpz_tdiv which "truncates" towards zero, so the remainder has the same sign as the value being reduced (if the divisor is positive).

I believe the reason for the change was so that MachineInt % BigInt could give a MachineInt result even if the arg is negative (but this was not mentioned in any change log).

The doc also says that negative divisors are not allowed, but the code which checks this has been commented out.

Note that the CoCoA-5 fn Mod calls directly the CoCoALib fn mod. This is probably good (because it should simplify porting C5 code into C++/CoCoALib) but then the C5 doc must also be updated!

What to do??

History

#1 - 21 Mar 2012 15:22 - John Abbott

The use of tdiv functions produces a (pleasing) sign symmetry:

1. namely A%B = - ((-A)%B) = - A%(-B) = (-A)%(-B)
2. also we always have A = div(A,B) + A%B

The negative aspect is that the range of A%B includes negative values; indeed any value from 1-|B| to |B|-1 may occur.

JAA also recalls that negative divisors were banned in CoCoALib for a while, but that this restriction was removed because it was "unnecessary" and only weakly justifiable: I wanted to use fdiv for non-negative remainders and tdiv for integer quotients because this seemed more natural -- this meant that condition (2) would not hold for negative B.

JAA proposes that we accept the current (tdiv) impl, and adjust the documentation accordingly -- giving an example to show that negative remainders can arise.

#2 - 01 Aug 2014 08:59 - Anna Maria Bigatti

- Target version set to CoCoALib-1.0

#3 - 13 Mar 2024 21:01 - John Abbott

- Category set to Documentation

- Status changed from New to Closed

- Assignee set to John Abbott

- Target version changed from CoCoALib-1.0 to CoCoALib-0.99850

- % Done changed from 0 to 100

- Estimated time changed from 4.00 h to 0.76 h

As far as I can tell we have had no problems with this over the last 10 years.
I have rectified the documentation (in BigIntOps.txt). Closing

#4 - 28 Mar 2024 16:44 - Anna Maria Bigatti

- Related to Support #1687: Release CoCoALib 0.99850 added

#5 - 29 Mar 2024 09:00 - Anna Maria Bigatti

- Related to deleted (Support #1687: Release CoCoALib 0.99850)