CoCoALib - Bug #666

RatReconstructByLattice fails in some simple cases

19 Feb 2015 15:01 - John Abbott

Status:	Closed	**Start date:**	19 Feb 2015
Priority:	Urgent	**Due date:**	
Assignee:	John Abbott	**% Done:**	100%
Category:	Maths Bugs	**Estimated time:**	2.10 hours
Target version:	CoCoALib-0.99536 June 2015	**Spent time:**	1.65 hour

Description

RatReconstructByLattice(1,1145) returns failure -- why??

History

#1 - 19 Feb 2015 15:04 - John Abbott

I ran the following to compare when ContFrac and Lattice methods are better

```
for M := 1000 to 2000 do
  for X:=1 To div(M,2) Do
    CF := RatReconstructByContFrac(X,M);
    L := RatReconstructByLattice(X,M);
    if CF.failed and not(L.failed) then println "L wins for [X,M]=",[X,M]; endif
    if L.failed and not(CF.failed) then println "CF wins for [X,M]=",[X,M]; endif
  endfor;
endfor;
```

It seems that RatReconstructByLattice fails with input (1,N) for N=1145..2000.
Why??
Note range is N=1145..8192; N > 8192 works OK again!

#2 - 19 Feb 2015 17:56 - John Abbott

It seems that **both** RatReconstructByContFrac and RatReconstructByLattice **fail** on (1,N) for N < 1145. Then the CF method starts to work, but the lattice method starts to work only for a larger modulus.

#3 - 27 Feb 2015 13:36 - John Abbott

- Status changed from New to In Progress

- Assignee set to John Abbott

- % Done changed from 0 to 10

I now think that the problem may really be imprecise documentation.

#4 - 07 May 2015 14:24 - Anna Maria Bigatti

- Priority changed from Normal to Urgent

#5 - 21 May 2015 16:02 - John Abbott

- Status changed from In Progress to Feedback

- % Done changed from 10 to 90

I have added a comment to the documentation.

I discussed with Christof the possibility of throwing an exception when the modulus is too small, but we both think that it is pointless: there is already the boolean indication of "failure", and the risk of throwing an exception might force the caller to write try..catch blocks where they are practically never needed.

Regarding this matter as resolved, so moving it to feedback.

#6 - 25 Jun 2015 15:16 - John Abbott

- Status changed from Feedback to Closed

- % Done changed from 90 to 100

- Estimated time set to 2.10 h

Modified C5 doc too.