

CoCoALib - Design #1232

IsPrime(0)

29 Oct 2018 10:44 - John Abbott

Status:	Closed	Start date:	29 Oct 2018
Priority:	Normal	Due date:	
Assignee:	John Abbott	% Done:	100%
Category:	Various	Estimated time:	0.66 hour
Target version:	CoCoALib-0.99650 November 2019	Spent time:	0.70 hour
Description			
What should IsPrime(0) do?			
Currently it gives error (because arg must be strictly positive).			
I ask because I wanted to write a short demo for the students, and wanted to check whether the coeffring of a polyring is a (prime) finite field. I first wrote this:			
<pre>k := CoeffRing(P); if not(IsField(k)) or not(IsPrime(characteristic(k))) then error(...); endif;</pre>			
These lines will not handle gracefully the case that the coeffring is QQ (or any other field of char 0). Instead I would have to write			
<pre>k := CoeffRing(P); if not(IsField(k)) or characteristic(k) = 0 or not(IsPrime(characteristic(k))) then error(...); endif;</pre>			
In fact, CoCoA offers the functions IsFiniteField and LogCardinality , so maybe this issue is pointless?			
Anyway, I'd like a brief discussion.			
Related issues:			
Related to CoCoALib - Feature #898: New function: cardinality of finite field?		In Progress	27 Jun 2016

History

#1 - 29 Oct 2018 15:51 - Anna Maria Bigatti

- % Done changed from 0 to 10

I'd rather keep the error, as in this case you already have IsFiniteField.
I'm not sure whether one would expect it to be true in all possible situations.

#2 - 29 Oct 2018 17:52 - John Abbott

- Status changed from New to Closed

- Assignee set to John Abbott

- % Done changed from 10 to 100

- Estimated time set to 0.66 h

Indeed, I probably created IsFiniteField exactly for this reason. Also the correct code is clearer to read:

```
if not(IsFiniteField(k)) or LogCardinality(k) > 1 then error(...)
```

Though I admit that LogCardinality is not the most obvious name; maybe FiniteFieldExtnDeg would be clearer?
(FFED is a bit long though)

I confirm that the manual page for IsField refers also to IsFiniteField, so the fn is visible.

So, as Anna says, let's leave it as it is currently. Closing.

#3 - 29 Oct 2018 18:00 - Anna Maria Bigatti

John Abbott wrote:

Though I admit that LogCardinality is not the most obvious name; maybe FiniteFieldExtnDeg would be clearer?

yes, it would.

Maybe AlgExtDeg? in principle one could also ask it for $\mathbb{Q}\mathbb{Q}[x]/(f)$.

#4 - 29 Oct 2018 18:10 - John Abbott

- Related to Feature #898: New function: cardinality of finite field? added