

## CoCoA-5 - Bug #1613

### CRASH with RingHom from FrF

30 Sep 2021 22:35 - John Abbott

<b>Status:</b>	Closed	<b>Start date:</b>	30 Sep 2021
<b>Priority:</b>	High	<b>Due date:</b>	
<b>Assignee:</b>	Anna Maria Bigatti	<b>% Done:</b>	100%
<b>Category:</b>	Parser/Interpreter	<b>Estimated time:</b>	2.66 hours
<b>Target version:</b>	CoCoA-5.4.0	<b>Spent time:</b>	2.65 hours
<b>Description</b>			
The following causes a crash: why was the exception not caught and handled?			
<pre>define FlattenRing(R) // Assume R = QQ(a)[x] nx := NumIndets(R); QQa := BaseRing(CoeffRing(R)); na := NumIndets(QQa); FlatRing := NewPolyRing(CoeffRing(QQa), SymbolRange("x",1,na+nx)); a_image := [indet(FlatRing, j)   j in 1..na]; EmbedQQa := PolyAlgebraHom(QQa, FlatRing, a_image); phi := InducedHom(CoeffRing(R), EmbedQQa); x_image := [indet(FlatRing, na+j)   j in 1..nx]; return PolyRingHom(R, FlatRing, phi, x_image); enddefine; -- FlattenRing  /**/ QQa ::= QQ[a]; /**/ FrFQQa := NewFractionField(QQa); /**/ Px ::= FrFQQa[x,y]; /**/ FlattenRing(Px); /**/ JJ := It; /**/ use Px; /**/ f := a*x^2-1/a; /**/ JJ(f);  ***ERROR*** UNCAUGHT CoCoA error  ***** ****CoCoA ERROR**** ErrCode: CoCoA::ERR::BadPartialRingHomArg ****CoCoA ERROR**** Message: Partial RingHom is undefined for this argument ****CoCoA ERROR**** Context: FractionFieldImpl::InducedHomImpl::myApply ****CoCoA ERROR**** File: FractionField.C ****CoCoA ERROR**** Line: 789 *****  Process cocoa5 exited abnormally with code 1</pre>			
<b>Related issues:</b>			
Related to CoCoA-5 - Bug #1614: SourceRegion gives misleading error mesg		<b>Closed</b>	<b>02 Oct 2021</b>

### History

#### #1 - 30 Sep 2021 22:42 - John Abbott

Actually a separate bug: CommonDenom( $a*x^2-1/a$ ) gives 1 rather than a... Oops!

**NOTE** the code looks fine, and now **CommonDenom** seems to work... not sure what the problem was. Ignoring.

#### #2 - 01 Oct 2021 12:19 - John Abbott

- Status changed from New to In Progress

- % Done changed from 0 to 10

Simpler failing example:

```
Qa ::= QQ[a];
Qx ::= QQ[x];
phi:=PolyAlgebraHom(Qa,Qx,[indet(Qx,1)]);

F:=NewFractionField(Qa);
psi := InducedHom(F,phi);
use F;
psi(1/a);
```

Even simpler:

```
F3 ::= ZZ/(3);
phi := CanonicalHom(ZZ,F3);
psi := InducedHom(QQ,phi);
a:=psi(1/3);
```

Presumably the interpreter does not allow for "application" of a RingHom to fail... I wonder where that is in the source code (sigh)

### #3 - 01 Oct 2021 12:35 - John Abbott

Probable source code:

```
RINGHOM::eval around line 2792 in Interpreter.C
```

Probably called from: intrusive\_ptr<Value> InvocationExpression::implEval(RuntimeEnvironment \*runtimeEnv) const at line 3908

### #4 - 01 Oct 2021 13:53 - John Abbott

According to gdb the fn is called (indirectly) from Interpreter.C:3032 in Interpreter::run

I think the problem may lie here.

No time to investigate now.

**NOTE** perhaps the catch at line 3049 should be moved inside the block above???

**#5 - 04 Oct 2021 10:08 - John Abbott**

- Related to Bug [#1614](#): SourceRegion gives misleading error mesg added

**#6 - 04 Oct 2021 10:14 - Anna Maria Bigatti**

- Project changed from CoCoALib to CoCoA-5

- Category changed from Safety to Parser/Interpreter

- Assignee set to Anna Maria Bigatti

- Target version changed from CoCoALib-0.99800 to CoCoA-5.4.0

**#7 - 04 Oct 2021 12:13 - John Abbott**

- Status changed from In Progress to Resolved

- % Done changed from 10 to 80

Similar to issue [#1614](#), I have "hacked" the interpreter, and the examples seem to work now.

But I am not confident that the hack is sound and robust, so fear a future nasty jumping out on us at so point.

**#8 - 10 Nov 2021 18:07 - John Abbott**

- Status changed from Resolved to Closed

- % Done changed from 80 to 100

- Estimated time set to 2.66 h