

## CoCoA-5 - Bug #509

### SyzOfGens (CoCoA-5) does not have correct shifts

02 Apr 2014 14:45 - Anna Maria Bigatti

<b>Status:</b>	Closed	<b>Start date:</b>	03 Apr 2014
<b>Priority:</b>	High	<b>Due date:</b>	
<b>Assignee:</b>	Anna Maria Bigatti	<b>% Done:</b>	100%
<b>Category:</b>	Incomplete function	<b>Estimated time:</b>	2.00 hours
<b>Target version:</b>	CoCoA-5.1.0 Easter14	<b>Spent time:</b>	2.25 hours
<b>Description</b>			
<pre>/**/ Use R ::= QQ[x,y]; /**/ I := ideal(x^2, y^2, x+y); /**/ G := gens(SyzOfGens(I)); /**/ IsHomog(G[1]); false</pre>			
It should be true, with the correct shifts.			
<b>2014-04-08</b> fixed: now return true -- still needs cleaning			
<b>Related issues:</b>			
Related to CoCoA-5 - Feature #200: add modules and module operations		<b>Closed</b>	<b>29 Jun 2012</b>
Related to CoCoA-5 - Feature #529: Naive version of resolution and Betti numbers		<b>Closed</b>	<b>09 Apr 2014</b>
Related to CoCoALib - Feature #1206: syz, SyzOfGens: which shifts for zero?		<b>Closed</b>	<b>02 Aug 2018</b>
Follows CoCoALib - Bug #510: SyzOfGens (CoCoALib): fix shifts		<b>Closed</b>	<b>02 Apr 2014</b>

#### History

##### #1 - 02 Apr 2014 14:47 - Anna Maria Bigatti

- Target version changed from CoCoA-5.1.0 Easter14 to CoCoALib-0.99533 Easter14

##### #2 - 02 Apr 2014 14:49 - Anna Maria Bigatti

- Project changed from CoCoALib to CoCoA-5
- Category deleted (Maths Bugs)
- Target version deleted (CoCoALib-0.99533 Easter14)

##### #3 - 02 Apr 2014 14:50 - Anna Maria Bigatti

- Category set to Incomplete function
- Target version set to CoCoA-5.1.0 Easter14

##### #4 - 02 Apr 2014 14:53 - Anna Maria Bigatti

- Due date deleted (03 Apr 2014)

##### #5 - 02 Apr 2014 14:53 - Anna Maria Bigatti

- Subject changed from SyzOfGens does not have correct shifts to SyzOfGens (CoCoA-5) does not have correct shifts

##### #6 - 08 Apr 2014 16:26 - Anna Maria Bigatti

- Status changed from New to In Progress
- % Done changed from 0 to 20
- Estimated time set to 5.00 h

Fixed the code for adding the shifts.

Needs more testing and flexible interfaces.

This is essentially what we can do now to compute a resolution (still a bit verbose):

```
/**/ Use R ::= QQ[x,y,z]; I := ideal(x, y, z^2);
/**/ S := MinGens(SyzOfGens(I)); S;
[[y, -x, 0], [0, z^2, -y], [z^2, 0, -x]]

/**/ M := submodule(ModuleOf(S[1]), S);
/**/ S := MinGens(SyzOfGens(M)); S;
[[z^2, x, -y]]

/**/ M := submodule(ModuleOf(S[1]), S);
/**/ S := MinGens(SyzOfGens(M)); S;
[]
```

#### #7 - 08 Apr 2014 18:00 - Anna Maria Bigatti

Now we have **submodule(gens)** issue [#200](#)  
so this is now more compact

```
/**/ Use R ::= QQ[x,y,z]; I := ideal(x, y, z^2);
/**/ S := MinGens(SyzOfGens(I)); S;
[[y, -x, 0], [0, z^2, -y], [z^2, 0, -x]]

/**/ S := MinGens(SyzOfGens(submodule(S))); S;
[[z^2, x, -y]]

/**/ S := MinGens(SyzOfGens(submodule(S))); S;
[]
```

#### #8 - 08 Apr 2014 20:13 - Anna Maria Bigatti

- % Done changed from 20 to 50

- Estimated time changed from 5.00 h to 2.00 h

Now that **shifts** is ported to CoCoA-5 more testing can be done.

**#9 - 10 Apr 2014 18:02 - Anna Maria Bigatti**

- *Status changed from In Progress to Closed*
- *Priority changed from Normal to High*
- *% Done changed from 50 to 100*

(Naive resolution implemented) now shifts are tested and working fine. Closing.

**#10 - 02 Aug 2018 14:55 - Anna Maria Bigatti**

- *Related to Feature #1206: syz, SyzOfGens: which shifts for zero? added*