

## CoCoALib - Feature #374

### Porting "IdealOfProjectivePoints"

18 Jun 2013 08:15 - Anna Maria Bigatti

<b>Status:</b>	Closed	<b>Start date:</b>	18 Jun 2013
<b>Priority:</b>	Immediate	<b>Due date:</b>	
<b>Assignee:</b>	John Abbott	<b>% Done:</b>	100%
<b>Category:</b>	New Function	<b>Estimated time:</b>	1.99 hour
<b>Target version:</b>	CoCoALib-0.99600	<b>Spent time:</b>	1.90 hour
<b>Description</b>			
port also IdealOfProjectivePoints			
<b>Related issues:</b>			
Related to CoCoALib - Feature #121: Porting "IdealOfPoints"		<b>Closed</b>	<b>04 Apr 2012</b>
Related to CoCoA-5 - Feature #960: New function: IdealAndSeparatorsOfPoints		<b>New</b>	<b>02 Nov 2016</b>
Related to CoCoALib - Bug #1416: IdealOfProjectivePoints and MinGens		<b>Closed</b>	<b>14 Feb 2020</b>

### History

#### #1 - 18 Jun 2013 08:34 - Anna Maria Bigatti

requested by Marie Ermete and Susan Cooper

#### #2 - 18 Jun 2013 08:49 - Anna Maria Bigatti

- Category set to New Function

- Assignee set to John Abbott

- Target version set to CoCoA-5.1.0 Easter14

I know this is not pretty, but for the time being there is this workaround (if you can put your points in an affine space)

```
/**/ Use R ::= QQ[x,y,z];
/**/ AffPolyRing := NewPolyRing(QQ, first(IndetSymbols(R),2));
/**/ phi := PolyAlgebraHom(AffPolyRing, R, first(indets(R),2));

/**/ Pts := [[0,0,1],[1/2,1,1],[0,1,2]];
/**/ AffPts := [ [P[1]/P[3], P[2]/P[3]] | P In Pts];

/**/ AffI := IdealOfPoints(AffPolyRing, Mat(AffPts));
/**/ I := ideal([homog(phi(F), last(indets(R)) | F in gens(AffI)]);
/**/ I;
ideal(y^2 -x*z +(-1/2)*y*z, x*y -x*z, x^2 +(-1/2)*x*z)
```

#### #3 - 21 Mar 2014 14:33 - Anna Maria Bigatti

- Target version changed from CoCoA-5.1.0 Easter14 to CoCoALib-0.99532

**#4 - 01 Apr 2014 19:20 - Anna Maria Bigatti**

- Target version changed from CoCoALib-0.99532 to CoCoALib-0.99533 Easter14

**#5 - 07 Apr 2014 18:20 - John Abbott**

- Target version changed from CoCoALib-0.99533 Easter14 to CoCoALib-0.99534 Seoul14

**#6 - 10 Jul 2014 16:32 - John Abbott**

- Target version changed from CoCoALib-0.99534 Seoul14 to CoCoALib-1.0

**#7 - 02 Nov 2016 09:02 - Anna Maria Bigatti**

- Related to Feature #960: New function: IdealAndSeparatorsOfPoints added

**#8 - 06 Aug 2018 18:11 - John Abbott**

- Status changed from New to In Progress

- Priority changed from Normal to Immediate

- Target version changed from CoCoALib-1.0 to CoCoALib-0.99600

- % Done changed from 0 to 50

Anna has done the work, but it gives obviously wrong result (not homog).

Here is a failing example:

```

use P ::= QQ[x,y,z];
L := [[1,1,2],[1,2,4]];
I := IdealOfProjectivePoints(P, mat(L));
ideal(y + (-1/2)*z, x^2 + (-3/4)*x + (1/8)*z)
--> result is not homog

```

The result is "almost right": the coeffs are correct, but the PPs are wrong. I compared with C-4.7.6. Correct answer is:

```

ideal(y + (-1/2)*z, x^2 + (-3/4)*x*z + (1/8)*z^2)

```

Note that non leading PPs of the second poly are missing a factor of z!

**#9 - 06 Aug 2018 18:58 - Anna Maria Bigatti**

fixed bug: now result is homog

**#10 - 08 Feb 2019 20:56 - John Abbott**

- *Status changed from In Progress to Closed*
- *% Done changed from 50 to 100*
- *Estimated time set to 1.99 h*

There was just one test. I have just tried it, and it worked. So closing.

**#11 - 14 Feb 2020 09:01 - Anna Maria Bigatti**

- *Related to Bug #1416: IdealOfProjectivePoints and MinGens added*