

## CoCoALib - Bug #1281

### Factor of multivariate sometimes prints ERROR

04 May 2019 20:55 - John Abbott

<b>Status:</b>	New	<b>Start date:</b>	04 May 2019
<b>Priority:</b>	High	<b>Due date:</b>	
<b>Assignee:</b>		<b>% Done:</b>	10%
<b>Category:</b>	Maths Bugs	<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>	CoCoALib-0.99880	<b>Spent time:</b>	1.20 hour
<b>Description</b>			
Here is an example:			
<pre>use QQ[x,y]; f := -x^4*y^3 -x^2*y +1; facs := factor(f); --&gt; do this 97 times ERROR: maximum deg in destination polynomial too low</pre>			
Despite the error message, the answer seems to be correct.			

### History

#### #1 - 04 May 2019 21:05 - John Abbott

The simplest examples (with 3 terms) seem to be of deg 7 (none found in deg 6 or deg 5).

```
-x^6*y -x^2 +1
-x^6*y -x^5*y +1
-x^4*y^3 -x^2*y +1
-x^5*y^2 +x^3*y +1
```

The signs of the coeffs seem to be important: I found no example with all coeffs equal to +1.

Just found a lower deg example:

```
-x^4*y +x^2 +x +1
x^4*y +x^3*y -x^2 +2
-x^4*y +x^4 -x^2 +x +1
-x^4*y -x^3*y -x^2*y -x^2 +1
```

There seem to be only 2 examples in deg 5 with 4 terms. The error mesg can be produced by fns in one of two files:

- DUPZexgcd.c
  - DUPZinterp.c
- The relevant line is a call to JERROR with arg JERROR\_DEG\_TOO\_LOW

**#2 - 08 Jan 2020 22:57 - John Abbott**

- Target version changed from CoCoALib-0.99700 to CoCoALib-0.99800

**#3 - 06 Oct 2020 14:49 - John Abbott**

- Target version changed from CoCoALib-0.99800 to CoCoALib-0.99850

**#4 - 16 Nov 2021 10:24 - Anna Maria Bigatti**

I confirm I (rarely) meet this error with tough examples in our development of Comprehensive Groebner Systems.

**#5 - 16 Nov 2021 10:38 - Anna Maria Bigatti**

When it happens, it happens in pairs. Run this:

```
for i := 1 to 1000 do
  facs := factor(x^6*y + x^2 - 1);
  println i, facs.RemainingFactor = 1, facs.factors = [x^6*y + x^2 - 1],
          facs.multiplicities = [1];
endfor;
```

**#6 - 16 Nov 2021 10:38 - Anna Maria Bigatti**

- % Done changed from 0 to 10

**#7 - 21 Jan 2024 20:03 - John Abbott**

- Target version changed from CoCoALib-0.99850 to CoCoALib-0.99880