ERRORS IN "COMPUTATIONAL LINEAR AND COMMUTATIVE ALGEBRA"

- pag. 64 Example 2.2.19

$$A_2 = \begin{pmatrix} 0 & 2 & 0 & 1 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 \end{pmatrix} \longrightarrow A_2 = \begin{pmatrix} 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

- line -3   This is an matrix $\longrightarrow$ This is a matrix

- pag. 172 Algorithm 4.5.22
an algorithm checks $\longrightarrow$ an algorithm which checks
(1) $B = (t_1, ..., t_d) \longrightarrow B = (b_1, ..., b_d)$

- pag. 177 Example 4.6.5 is not a counterexample. Replace it with the following:

Example 4.6.5. Let $K = \mathbb{Q}$, let $P = K[x, y]$, let I be the vanishing ideal of the affine set of eight points given by $p_1 = (1, -1)$, $p_2 = (0, 2)$, $p_3 = (1, 1)$, $p_4 = (1, 2)$, $p_5 = (0, 1)$, $p_6 = (1, 3)$, $p_7 = (2, 4)$, and $p_8 = (3, 4)$, and let $R = P/I$. The reduced Gröbner basis of I with respect to `DegRevLex` is

$$x^2y - 4x^2 - xy + 4x, \quad x^3 + xy^2 - 6x^2 - 3xy - y^2 + 7x + 3y - 2,$$
$$y^4 - 10xy^2 - 5y^3 + 15x^2 + 30xy + 15y^2 - 35x - 25y + 14,$$
$$xy^3 - 7xy^2 - y^3 + 14xy + 7y^2 - 8x - 14y + 8$$

Since this term ordering is degree compatible, the residue classes of the elements in the tuple $(1, y, x, y^2, xy, x^2, y^3, xy^2)$ form a degree-filtered K-basis of R with increasing order tuple $(0, 1, 1, 2, 2, 2, 3, 3)$. On the other hand, the reduced Gröbner basis of I with respect to `Lex` is

$$x^2 - \tfrac{2}{3}xy^2 + 2xy - \tfrac{7}{3}x + \tfrac{1}{15}y^4 - \tfrac{1}{3}y^3 + y^2 - \tfrac{5}{3}y + \tfrac{14}{15},$$
$$xy^3 - 7xy^2 + 14xy - 8x - y^3 + 7y^2 - 14y + 8, \; y^5 - 9y^4 + 25y^3 - 15y^2 - 26y + 24$$

So, the residue classes of the elements in the tuple $B = (1, y, x, y^2, xy, y^3, xy^2, y^4)$ form a K-basis of R. Notice that we have $\bar{y}^4 = 10\bar{x}\bar{y}^2 + 5\bar{y}^3 - 15\bar{x}^2 - 30\bar{x}\bar{y} - 15\bar{y}^2 + 35\bar{x} + 25\bar{y} - 14$ in R, and therefore $\mathrm{ord}_{\overline{\mathcal{F}}}(\bar{y}^4) = 3$. Altogether, we see that B is not a degree-filtered basis, since its increasing order tuple is $(0, 1, 1, 2, 2, 3, 3, 3)$.

- pag. 180 Algorithm 4.6.13 items 4 and 5 have the wrong number

- pag. 183 Algorithm 4.6.21
(2) $C \in \mathrm{Mat}_d(K[y_1, \ldots, y_\Delta]) \longrightarrow C \in \mathrm{Mat}_d(K[z_1, \ldots, z_\Delta])$

- pag. 183 Example 4.6.22 first line
$I = \langle xy - x, \ldots \rangle \longrightarrow \langle xy - y, \ldots \rangle$

- pag. 194 line -4
A pointed out $\longrightarrow$ As pointed out

Date: October 26, 2017.