ERRATUM

ON THE MINIMAL POLYNOMIAL OF A MATRIX

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The page below was inadvertently omitted from the published paper, and should be inserted between page 96 and page 97.

Let $a_1 = (A_1^m)_{1,n_1}$ and $a_2 = (A_2^l)_{1,n_2}$. As explained in the first part of the proof, (in logspace) we can compute matrices B_1 and B_2 such that

$$\begin{aligned}\mu_{B_1}(x) &= x^{2m+2} - a_1x^{m+1}, \\ \mu_{B_2}(x) &= x^{2l+2} - a_2x^{l+1}.\end{aligned}$$

By C we denote again the companion matrix of x^{2m+2} . Define the matrix

$$D = \begin{bmatrix} B_1 & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & B_2 & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & C \end{bmatrix}.$$

Then we get

$$\begin{aligned}\mu_D(x) &= \text{lcm}\{\mu_{B_1}(x), \mu_{B_2}(x), \mu_C(x)\} \\ &= \text{lcm}\{x^{m+1}(x^{m+1} - a_1), x^{l+1}(x^{l+1} - a_2), x^{2m+2}\} \\ &= x^{2m+2} \text{lcm}\{x^{m+1} - a_1, x^{l+1} - a_2\}.\end{aligned}$$

Since $m > l$, we have

$$\deg(\mu_D(x)) = \begin{cases} 2m + l + 3, & \text{for } a_1 = 0, a_2 \neq 0, \\ 3m + 3, & \text{for } a_1 \neq 0, a_2 = 0, \\ 2m + 2, & \text{for } a_1 = 0, a_2 = 0, \\ 3m + 3 + r, & \text{for } a_1 \neq 0, a_2 \neq 0, \text{ where } r > 0. \end{cases}$$

We concluded that for every w

$$\begin{aligned}w \in L &\iff a_1 = 0 \text{ and } a_2 \neq 0 \\ &\iff \deg(\mu_D(x)) = 2m + l + 3.\end{aligned}$$

This completes the proof of the theorem. □

By Proposition 1 and Theorem 1 we obtain the following corollary.

Corollary 1 1) $\text{DEGMINPOL}_{\leq}$ is complete for $\mathbf{C}=\mathbf{L}$.

2) $\text{DEGMINPOL}_{=}$ is complete for $\mathbf{C}=\mathbf{L} \wedge \mathbf{coC}=\mathbf{L}$.

The following lemma completes the proof of Theorem 1.

Lemma 1 Let A be an $n \times n$ matrix and let $m \geq 1$. For any $k \geq 1$ there is a matrix $\tilde{A}$ of order $p = n(mk + 1)$ such that $(A^m)_{1,n} = (\tilde{A}^{km})_{1,p}$.