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ERRATA TO: COMPARISON OF REGULAR CONVOLUTIONS

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Abstract: My paper [1] gives an incorrect expression for least upper bound in the Browerian lattice $(\mathbf{A}/\varepsilon, \leq)$. A corrected expression is given.

In this short note we correct an error of the paper [1]. We use the same notations as in [1] and assume that the reader is familiar with these notations.

In [1] we noted that $(\mathbf{A}/\varepsilon, \leq)$ forms a Browerian lattice. This is true, but the expression

(1) $$(A/\varepsilon) \vee (B/\varepsilon) = \Big\{ C \in \mathbf{A} \colon \tau_{C_k}(p^e) = \gcd\Big(\tau_{A_k}(p^e), \tau_{B_k}(p^e)\Big) \text{ for all prime powers } p^e \Big\}$$

that we gave for least upper bound does not hold in general. For example, let $k = 1$ and

$$A(p^4) = B(p^4) = \{1, p^2, p^4\}\,, \quad \tau_A(p^4) = \tau_B(p^4) = 2\ ,$$
$$A(p^6) = \{1, p^2, p^4, p^6\}\,, \quad \tau_A(p^6) = 2\ ,$$
$$B(p^6) = \{1, p^3, p^6\}\,, \quad \tau_B(p^6) = 3\ .$$

Then $(A/\varepsilon) \vee (B/\varepsilon) = \{C\}$, where

(2) $$C(p^4) = \{1, p^2, p^4\}\,, \quad \tau_C(p^4) = \gcd(2,2) = 2\ ,$$

(3) $$C(p^6) = \{1, p, p^2, p^3, p^4, p^5, p^6\}\,, \quad \tau_C(p^6) = \gcd(2,3) = 1\ .$$

Since C is regular, (3) implies that $C(p^4) = \{1, p, p^2, p^3, p^4\}$, $\tau_C(p^4) = 1$, which is in contradiction to (2).

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Next, we derive an algorithm for computing $\tau_{C_k}(p^e)$ and thus correct (1).

Construct a decreasing sequence $t_1, t_2, t_3, ...$ of positive integers as follows:

$$t_1 = \gcd\Big(\tau_{A_k}(p^e), \tau_{B_k}(p^e)\Big) \ ,$$

$$t_2 = \gcd\Big(\tau_{A_k}(p^{t_1}), \tau_{A_k}(p^{2t_1}), ..., \tau_{A_k}(p^{r_1 t_1}), \tau_{B_k}(p^{t_1}), \tau_{B_k}(p^{2t_1}), ..., \tau_{B_k}(p^{r_1 t_1})\Big) \ ,$$

$$\vdots$$

$$t_{n+1} = \gcd\Big(\tau_{A_k}(p^{t_n}), \tau_{A_k}(p^{2t_n}), ..., \tau_{A_k}(p^{r_n t_n}), \tau_{B_k}(p^{t_n}), \tau_{B_k}(p^{2t_n}), ..., \tau_{B_k}(p^{r_n t_n})\Big) \ ,$$

where $r_i\,t_i = e$ for $i = 1, 2, ...$. Now, let s denote the least integer such that $t_s = t_{s+1}$. Then

$$\tau_{C_k}(p^e) = t_s \ . \tag{4}$$

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REFERENCES

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