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NUMBER THEORY

Erratum to the Paper "Fibonacci Numbers with the Lehmer Property"

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by

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Here, I correct an oversight from the paper mentioned in the title. In the proof of (3), in the inequality

$$2^K \log K < \frac{n}{4} + \frac{\log 2}{4\log\log n},$$

the last term above should have been $n\log 2/(4\log\log n)$. Reworking the next few inequalities we arrive at

$$\frac{n}{3} < \frac{n}{4} + \frac{n\log 2}{4\log\log n},$$

which implies that $\log\log n < 3\log 2$, so $n < e^8 < 3000$ (instead of $n < 2$). However, since $\omega(F_n) \geq 14$ and F_n is odd, we get

$$2^{14} \mid 2^{\omega(F_n)} \mid \phi(F_n) \mid F_n - 1$$

and $F_n - 1 = F_{(n+\delta)/2}L_{(n-\delta)/2}$ for some $\delta \in \{\pm 2, \pm 1\}$. Observing that $(n+\delta)/2 - (n-\delta)/2 = \delta \in \{\pm 2, \pm 1\}$, we conclude that $(n+\delta)/2$ and $(n-\delta)/2$ cannot both be multiples of 3. This shows that one and only one of $F_{(n+\delta)/2}$ and $L_{(n-\delta)/2}$ is even, so one of them is a multiple of 2^{14}. Since 8 never divides L_m for any positive integer m, it follows that 2^{14} divides $F_{(n+\delta)/2}$, so $3\cdot 2^{12} = 12288$ divides $(n+\delta)/2$, a positive integer smaller than 1500, which is a contradiction. This proves (3). The rest of the paper is unaffected.

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