Corrigendum


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A R T I C L E   I N F O

Article history:
Available online xxxx

Keywords:
String
Primitive string
Square
Double square
Factorization

The erratum concerns the following changes: Lemma 3, Corollary 4 and relevant changes in their proofs, the Conclusion, and an acknowledgment to our Ph.D. student, Adrien Thierry, who pointed out the inconsistency.

**Lemma 3** (page 19) should be replaced by

**Lemma 3.** Let \( u^2 = v^2 \) be proper prefixes of \( w^2 \), then \( |u| + |v| \leq |w| \) unless \( u = v_1^t, v = v_1^p v_2 \) and \( w = v_1^p v_2 v_1^p \) where \( v_1 \) is primitive, \( v_2 \) a proper possibly empty prefix of \( v_1, t > p_2, \) and \( p_1 \geq p_2 \geq 1 \).

The paragraph after **Lemma 3** (page 19) should be replaced by

**Lemma 3** shows that the strings \( (u, v, w) \) violating \( |u| + |v| < |w| \) consist of two types; one corresponding to the example given by Fraenkel and Simpson. **Corollary 4** illustrates that **Lemma 3** is a generalization of **Lemma 2**.

**Corollary 4** and its proof (page 19) should be replaced by

**Corollary 4.** Let \( u^2 \) be a proper prefix of \( v^2 \) that is a proper prefixes of \( w^2 \) and let \( u \) be primitive, then \( |u| + |v| \leq |w| \). Moreover, if \( |u| < |v| < 2|u| \) and either \( v \) or \( w \) is primitive, then \( |u| + |v| \leq |w| \).

**Proof.** Let us assume by contradiction that \( |u| + |v| > |w| \). Then by **Lemma 3**, \( u = v_1^t, v = v_1^p v_2 \) and \( w = v_1^p v_2 v_1^p \) for a primitive \( v_1 \), a proper possibly empty prefix \( v_2 \) of \( v_1 \), and \( t > p_2, p_1 \geq p_2 \geq 1 \). If \( u \) is primitive, \( t = 1 \) and so \( t > p_2 \geq 1 \) is a contradiction. If \( |v| < 2|u| \), then \( v_1^p v_2 v_1^p \) is a prefix of \( v_1^p v_2 \), which can only be true when \( v_2 \) is empty due to **Lemma 6**. If \( v \) is primitive, then \( p_1 = 1 \) and so \( p_2 = 1 \) and so \( u = v_1^t, t > 1 \) and \( v = v_1 \) and \( w = v_1^p \), and so \( |u| \geq |w| \), a contradiction. If \( w \) is primitive, then \( w = v_1 \), and so \( |w| = |v| \), a contradiction. □

DOI of original article: http://dx.doi.org/10.1016/j.jda.2015.05.006.

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http://dx.doi.org/10.1016/j.jda.2016.05.003
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Please cite this article in press as: H. Bai et al., Corrigendum to “On a lemma of Crochemore and Rytter” [Journal of Discrete Algorithms 34 (2015) 18–22], J. Discret. Algorithms (2016), http://dx.doi.org/10.1016/j.jda.2016.05.003
Beginning of section 3 till the end of Case 1 (page 20) should be replaced by:

Let \( u \neq v \), and \( u^2 \) and \( v^2 \) be both proper prefixes of \( w^2 \). Lemma 3 states that

\[
\{ u = v_1^t, \ v = v_1^{p_1}v_2, \ w = v_1^{p_1}v_2v_1^{p_2} \} \text{ or } (|u| + |v| \leq |w|).
\]  

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Case 1 in the proof (page 20) should be replaced by:

1. Case when \( u \) and \( v \) are not proportional, i.e. \( 2|u| \leq |v| \).

If \( |u| < |v_1| \), then \( |u| + |v| < |v_1|^{p_1+1} + |v_2| \leq |v_1|^{p_1+p_2} + |v_2| = |w| \).

If \( |u| \geq |v_1| \), since \( u^2 \) is a prefix of \( v = v_1^{p_1}v_2 \), then \( u^2 \) and \( v_1^{p_1}v_2 \) have a common factor of length \( |u| + |v_1| \), and by Lemma 7, \( u \) and \( v_1 \) have the same primitive root, and so \( v_1 \) is the primitive root of \( v \). Thus \( u = v_1^t \) for some \( t \geq 1 \), \( v = v_1^{p_1}v_2 \), and \( w = v_1^{p_1}v_2v_1^{p_2} \).

If \( t \leq p_2 \), then \( |u| + |v| \leq |w| \), but if \( t > p_2 \), then \( |u| + |v| > |w| \).

The Conclusion section (page 21) should be replaced by:

We showed that the conclusion of the Crochemore and Rytter’s lemma on three squares starting at the same position also holds under alternative conditions. The proof is based on a novel insight into the combinatorics of double squares.

The Acknowledgments (page 21) should be replaced by:

The authors would like to thank the anonymous referees for valuable comments and suggestions which improved the quality of the paper, and Adrien Thierry for pointing out an inconsistency in Lemma 3. This work was supported by grants from the Natural Sciences and Engineering Research Council of Canada Discovery Grant program (Franek: RGPIN25112-2012, Deza: RGPIN-2015-06163), by the Digeito Chair C&O program (Deza), and by the Canada Research Chairs program (Deza: CRC 950-213642).