IN SEARCH OF A BIJECTION BETWEEN β-NORMAL 3-INDECOMPOSABLE PLANAR LAMBDA TERMS AND $\beta(0,1)$-TREES

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During his CLA 2019 talk [3], Noam Zeilberger posed the following conjecture: β-normal internally 3-edge-connected planar lambda terms are counted by the OEIS sequence A000257 (for more details consult [2]). This very sequence is already known to enumerate other structures, among others $\beta(0,1)$-trees (see [1]), *i.e.*, rooted plane trees whose nodes are labeled with non-negative integers in the following way:

- leaves have label 0;
- the label of the root is one more than the sum of its children's labels;
- the label of any other node exceeds the sum of its children's labels by at most one.

In our talk we aim at presenting our approaches to find a constructive bijection between these two families of objects. So far, we have managed to find out some building blocks that, when smartly combined together, hopefully could lead us to establish a full recursive procedure for the translation in question. We strongly believe that our ideas can be further expanded and we count on the interaction with the audience.

References

[1] Anders Claesson, Sergey Kitaev, Anna de Mier: *An involution on bicubic maps and $\beta(0,1)$-trees.* The Australasian Journal of Combinatorics, Volume 61, pp. 1–18, 2015.
[2] OEIS Foundation Inc. (2020), The On-Line Encyclopedia of Integer Sequences, http://oeis.org/A000257.
[3] Noam Zeilberger: *Some topological properties of planar lambda terms.* Talk at the 14th Workshop Computational Logic and Applications, Versailles, France, 1–2 July 2019. Slides available at http://cla.tcs.uj.edu.pl/history/2019/slides/Zeilberger.pdf.

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