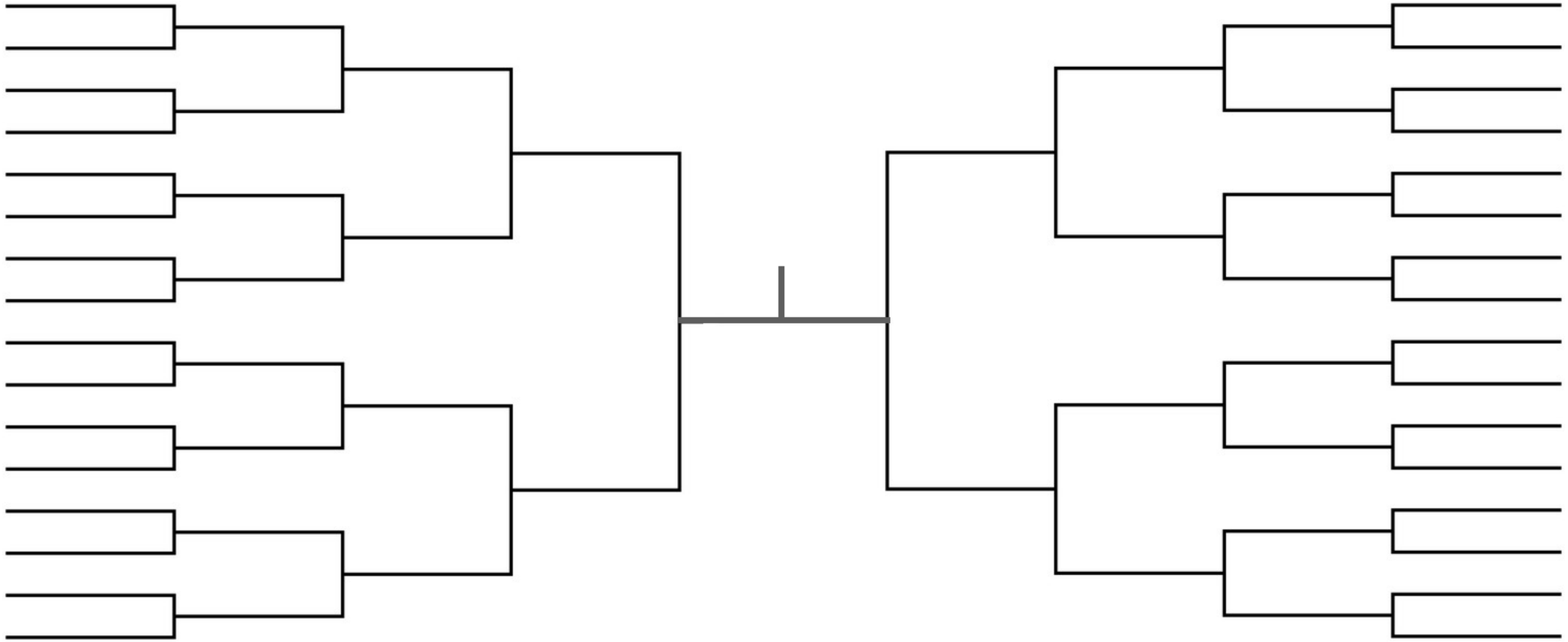
THE UNIVERSITY OF VERMONT
COLLEGE OF ENGINEERING &
MATHEMATICAL SCIENCES

Some Applications of Trees

CS 124 / Department of Computer Science

Trees are EVERYWHERE

Tournament Bracket



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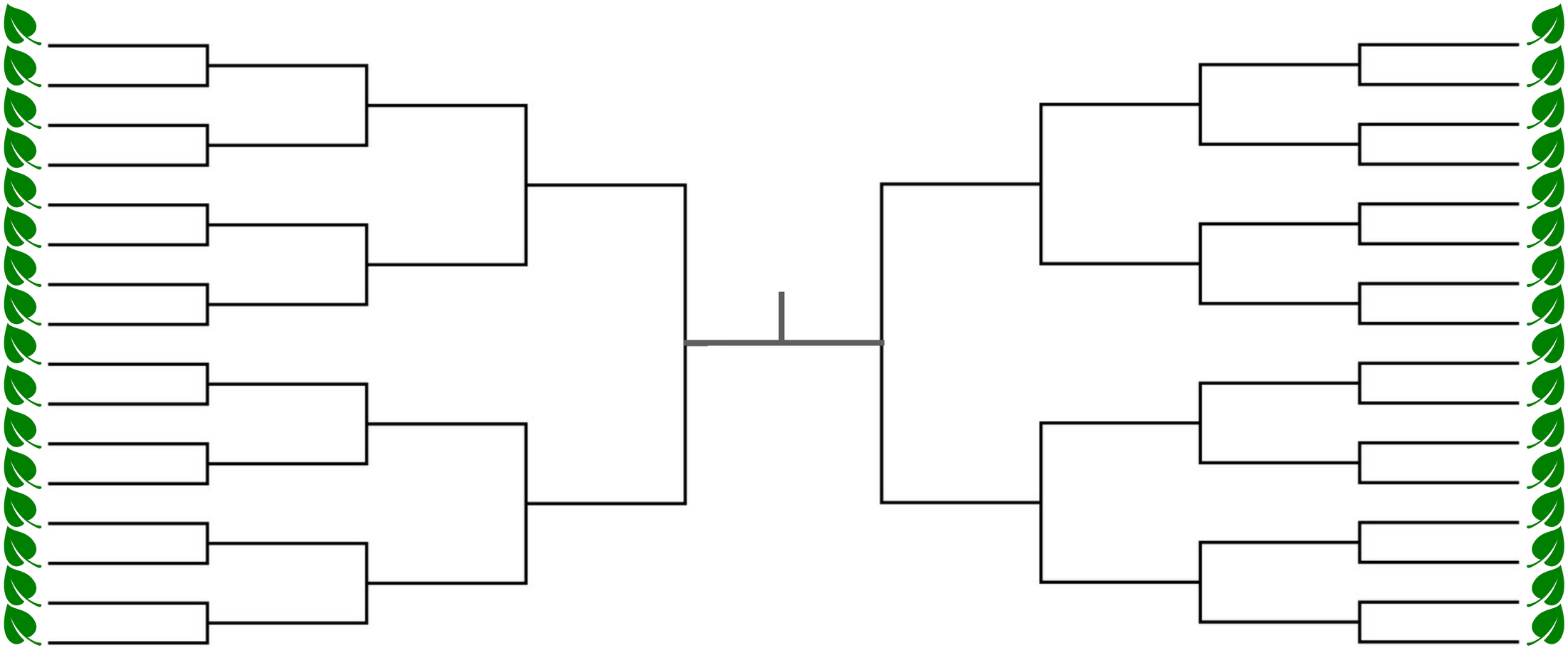

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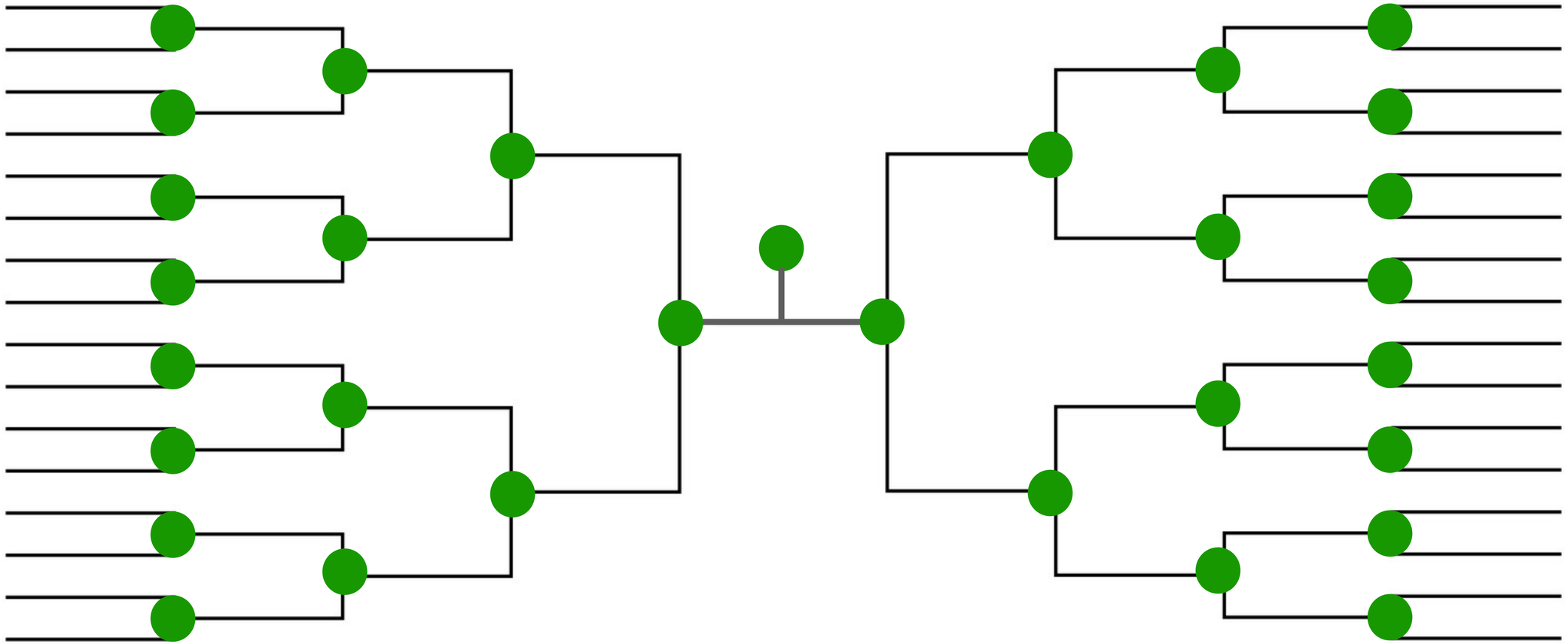

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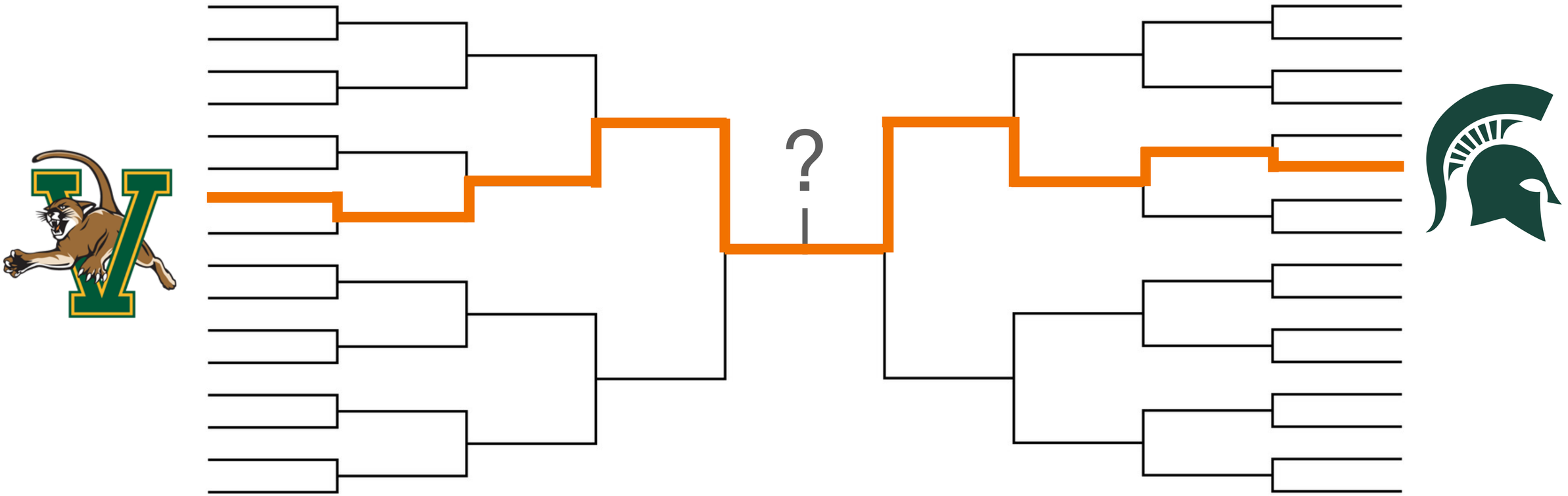

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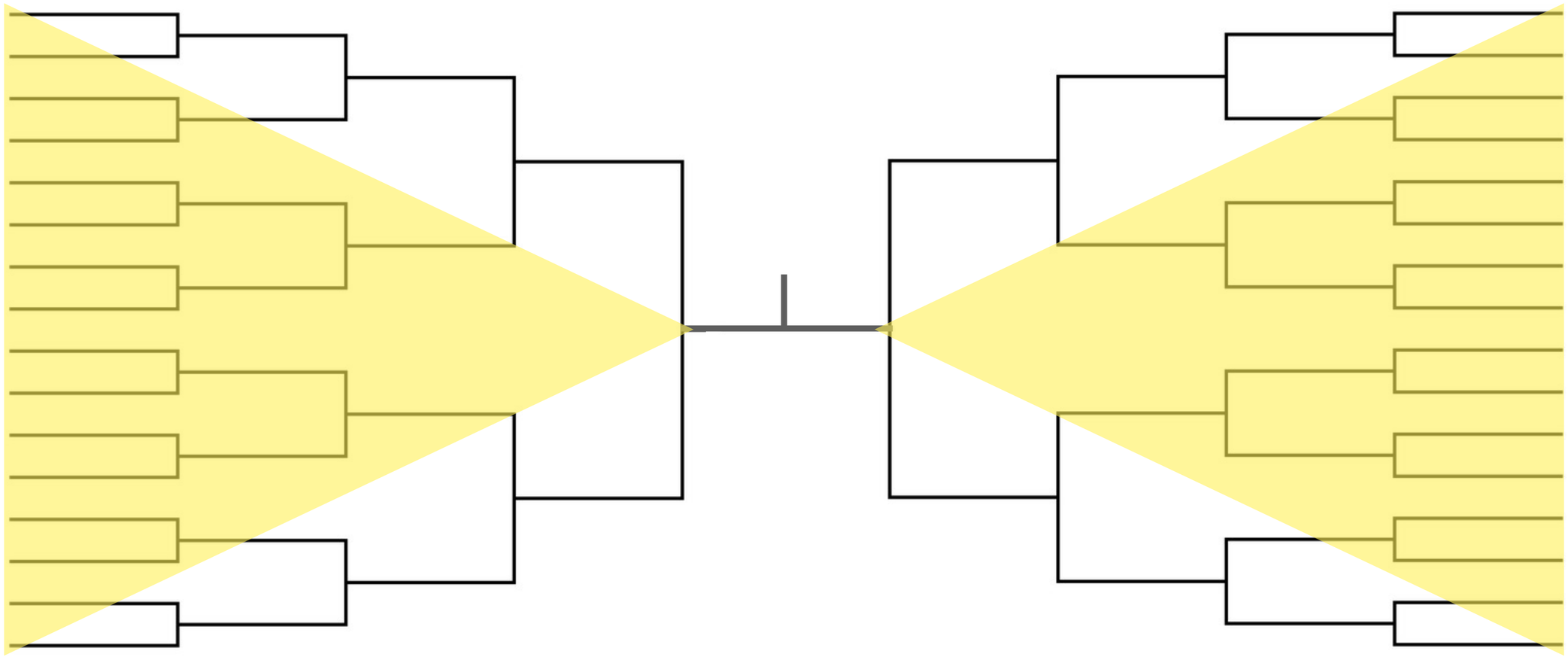

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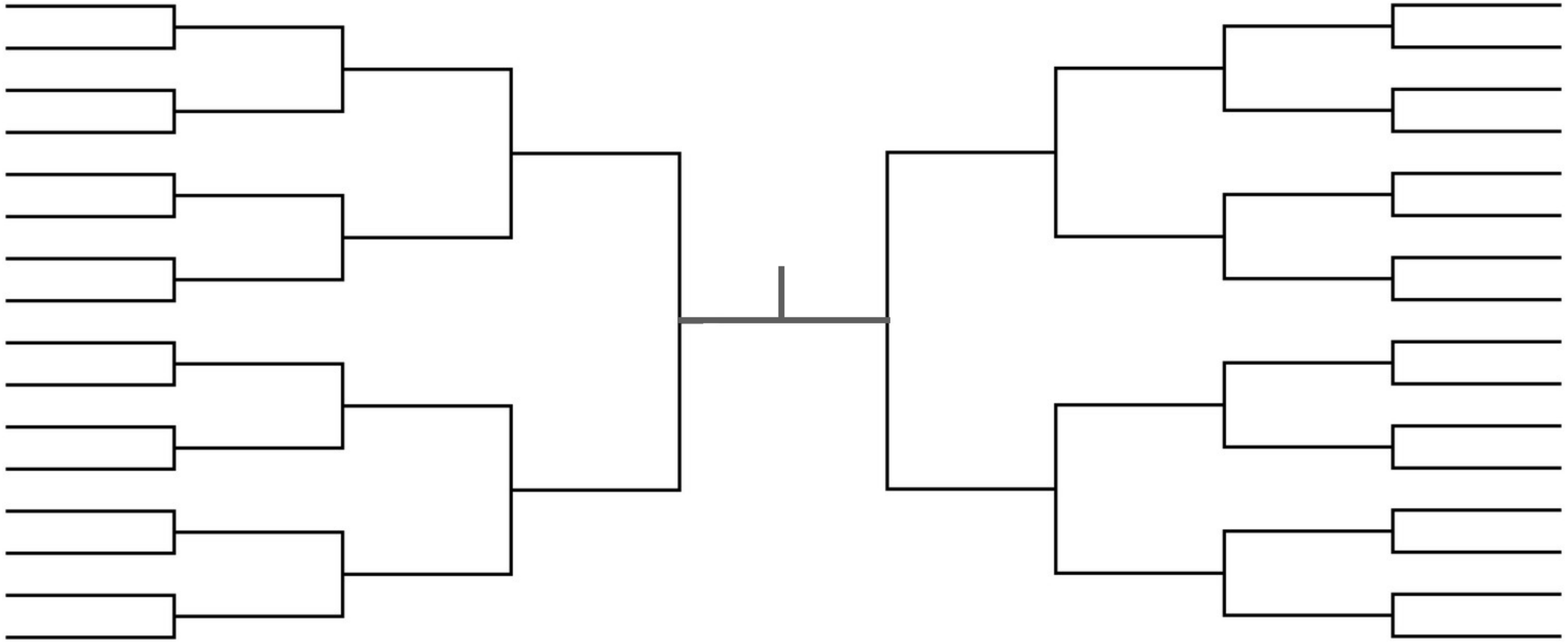

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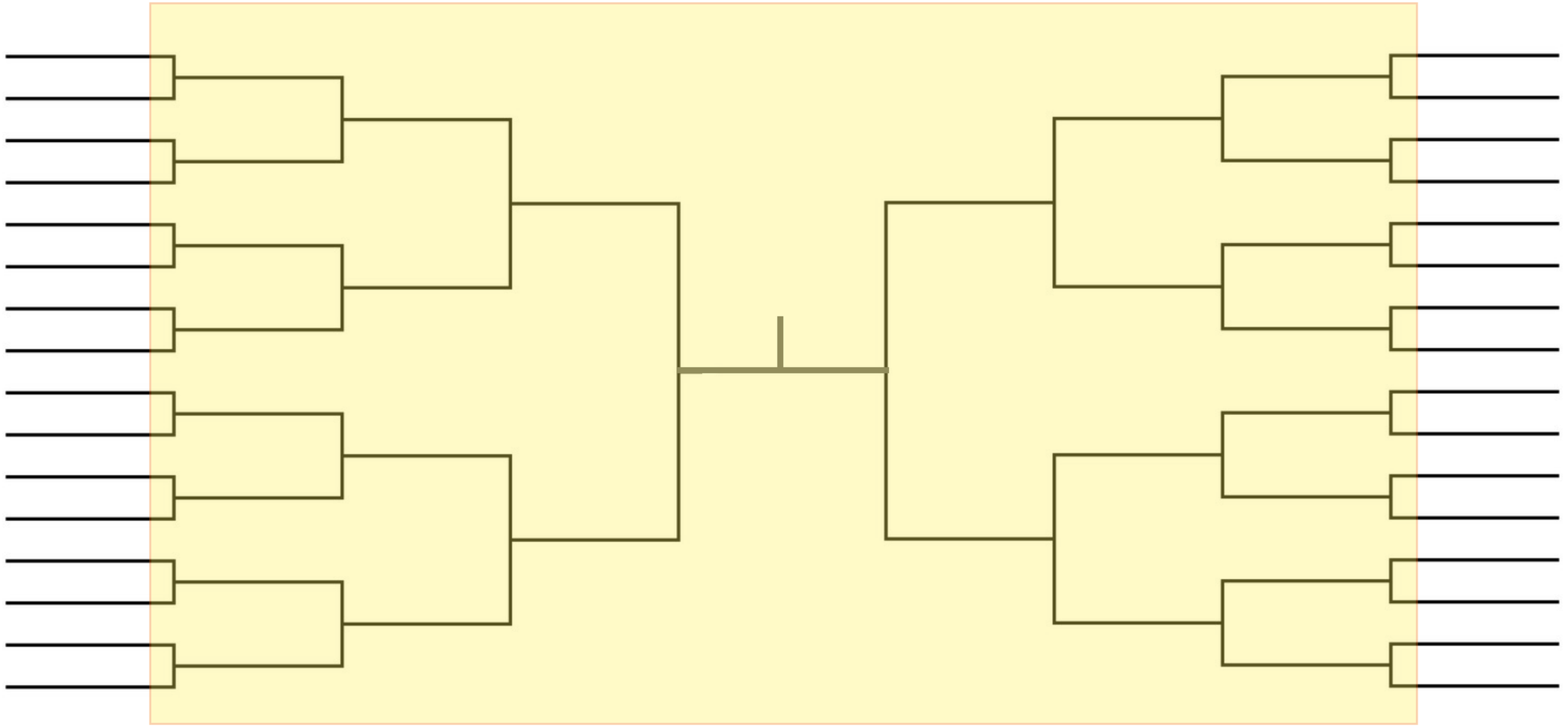

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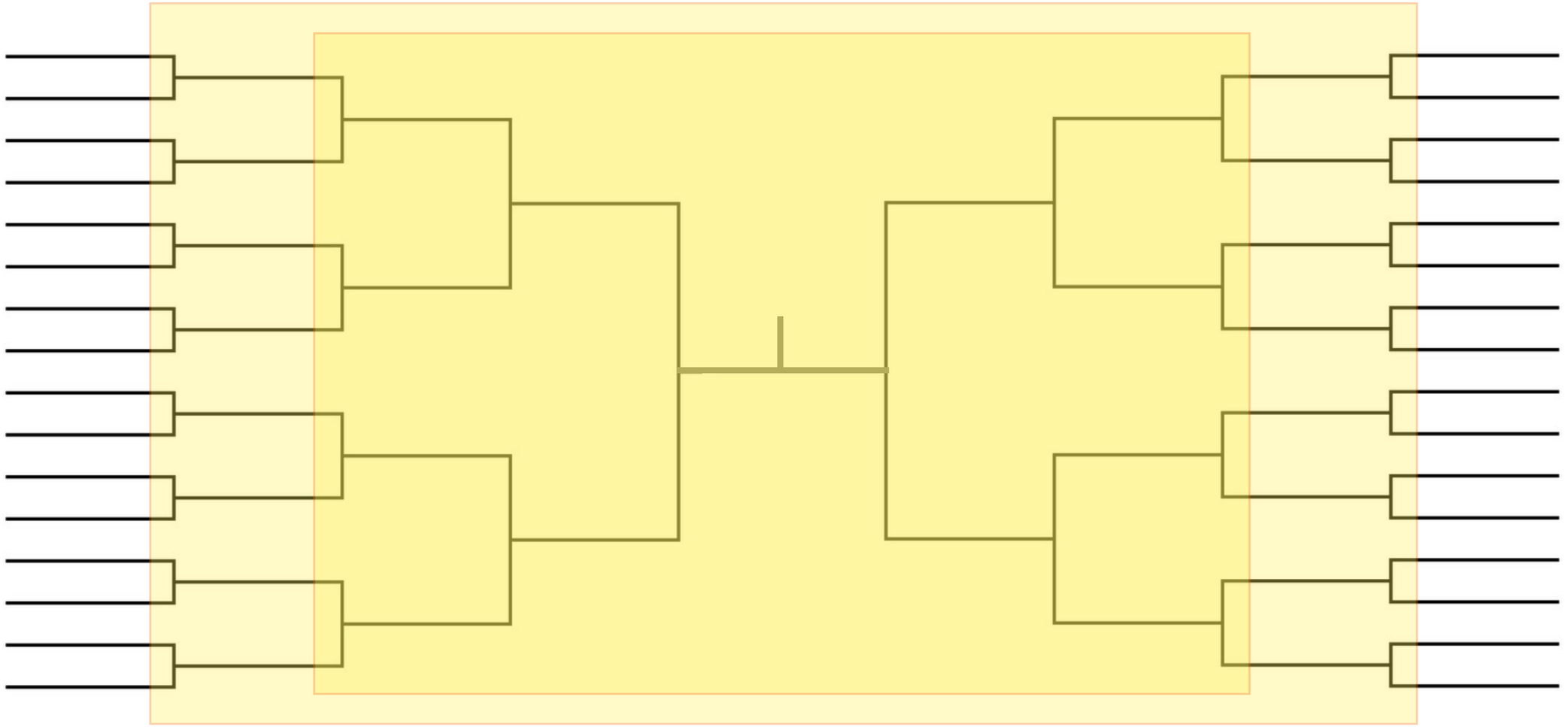

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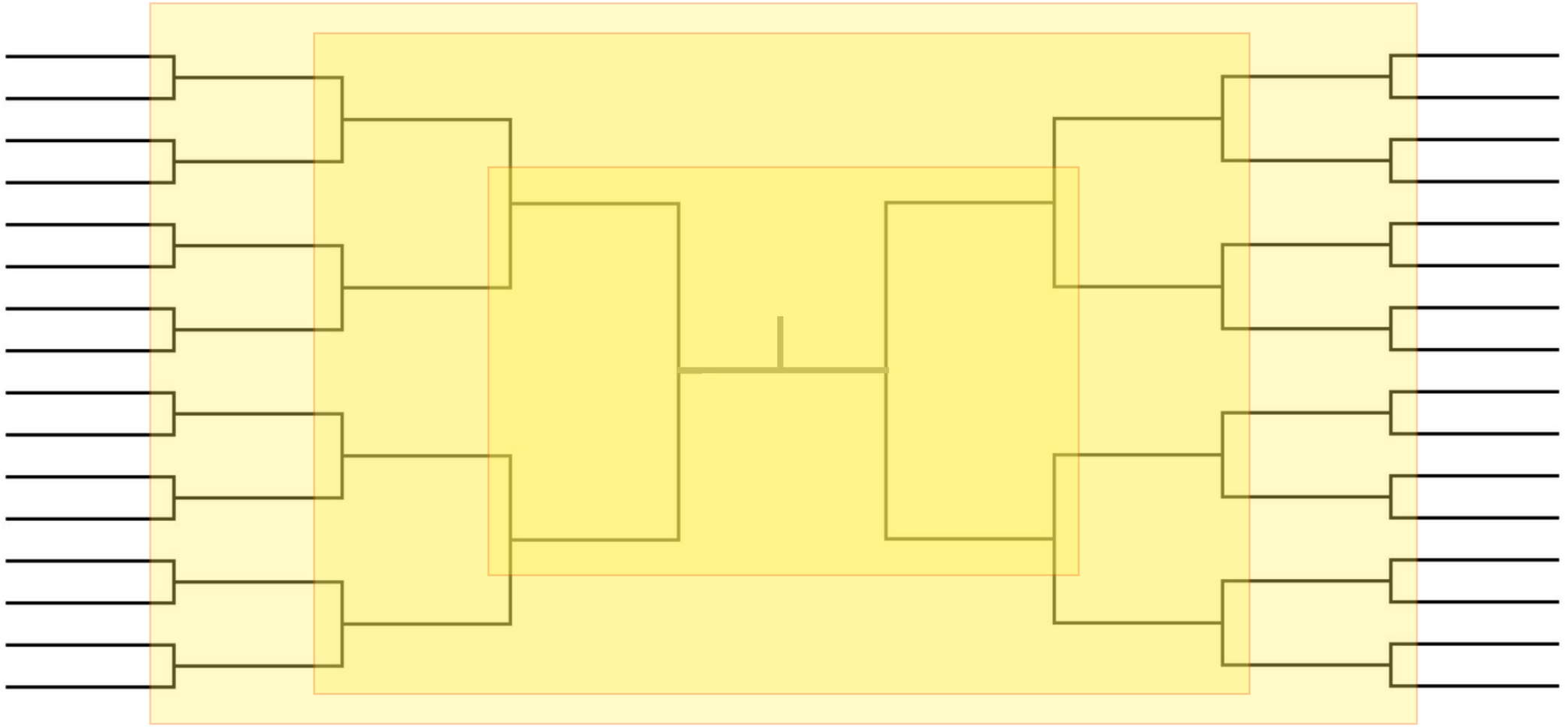

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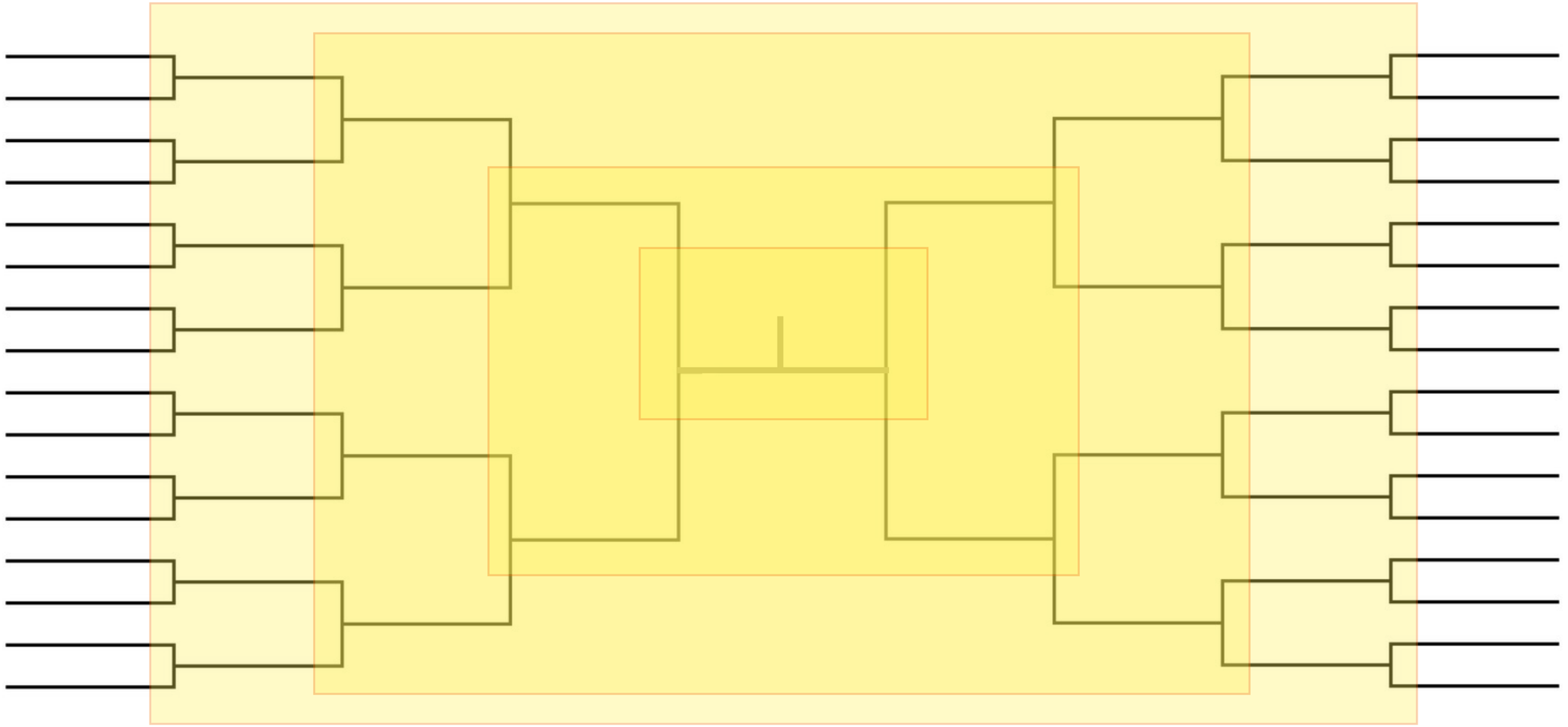

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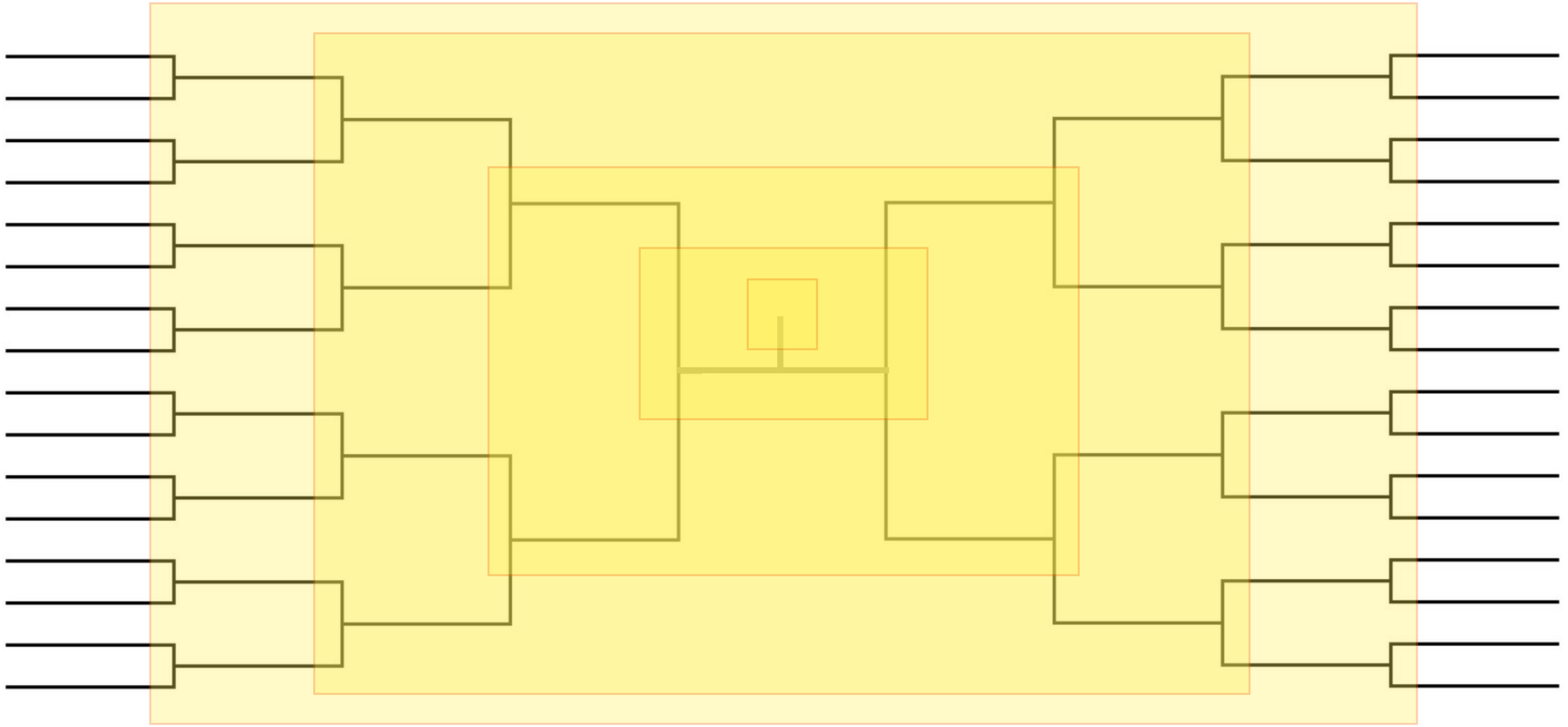
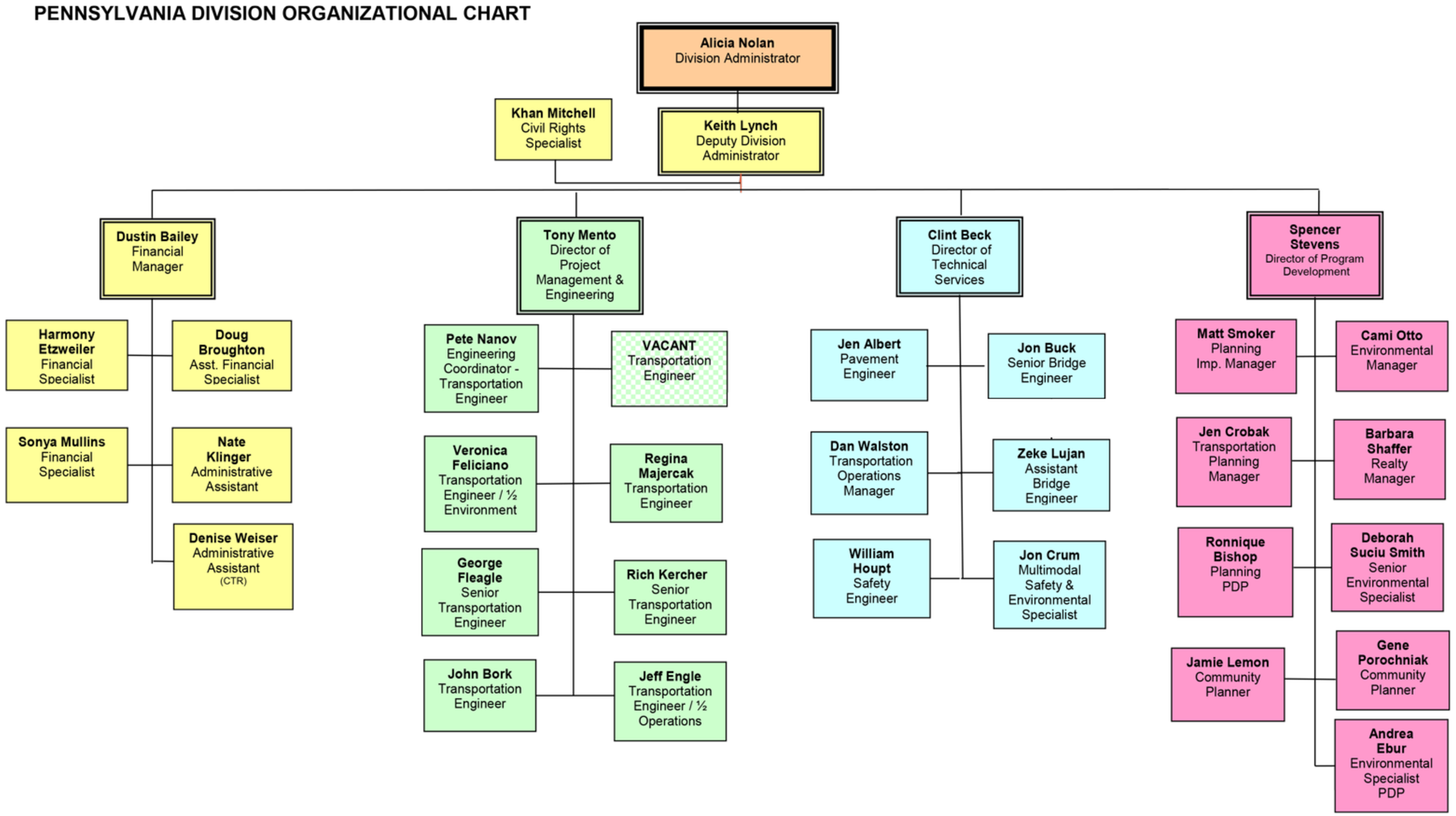


Organizations



Adapted from US DOT: https://www.fhwa.dot.gov/padiv/orgchart.cfm

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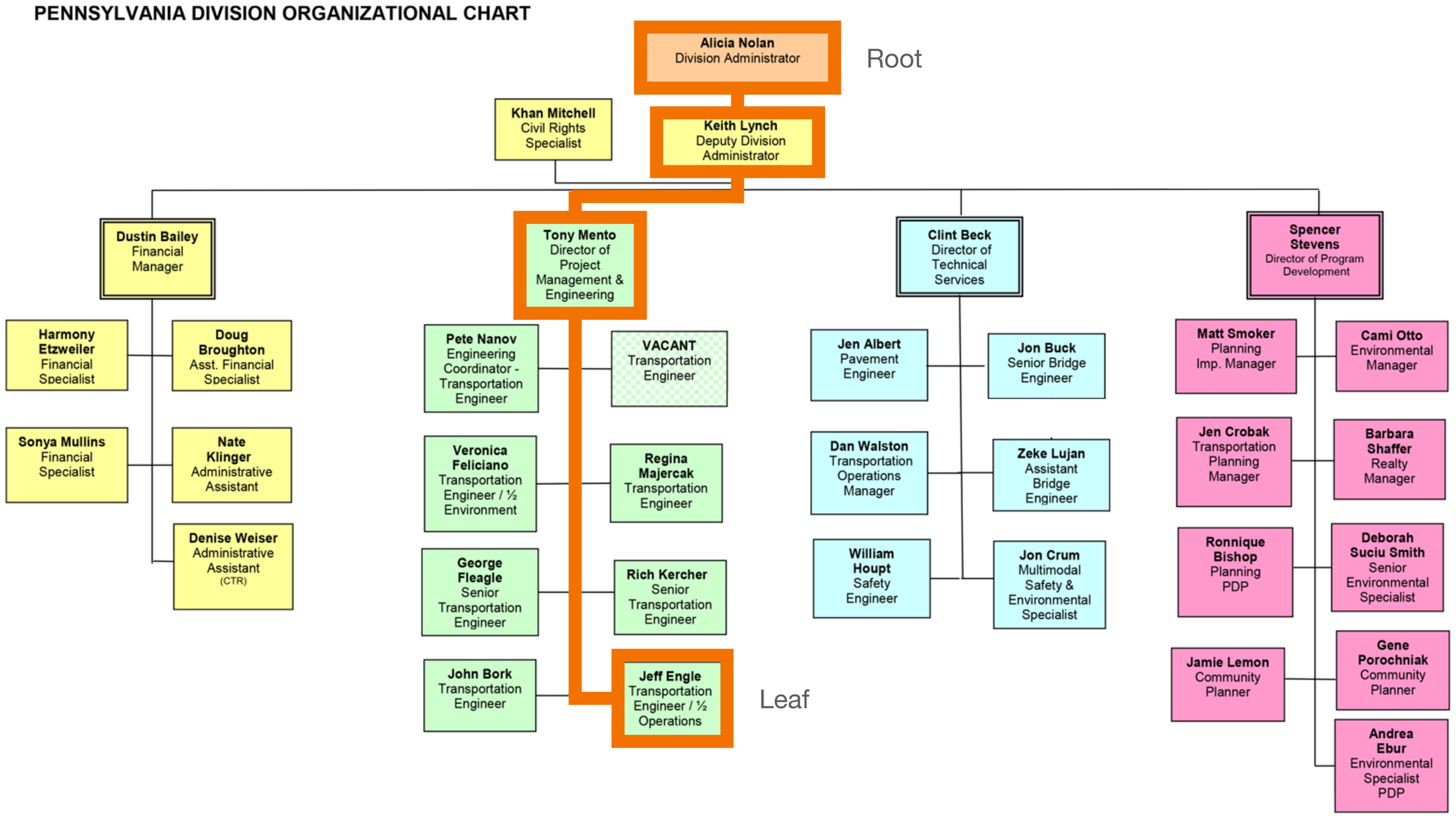

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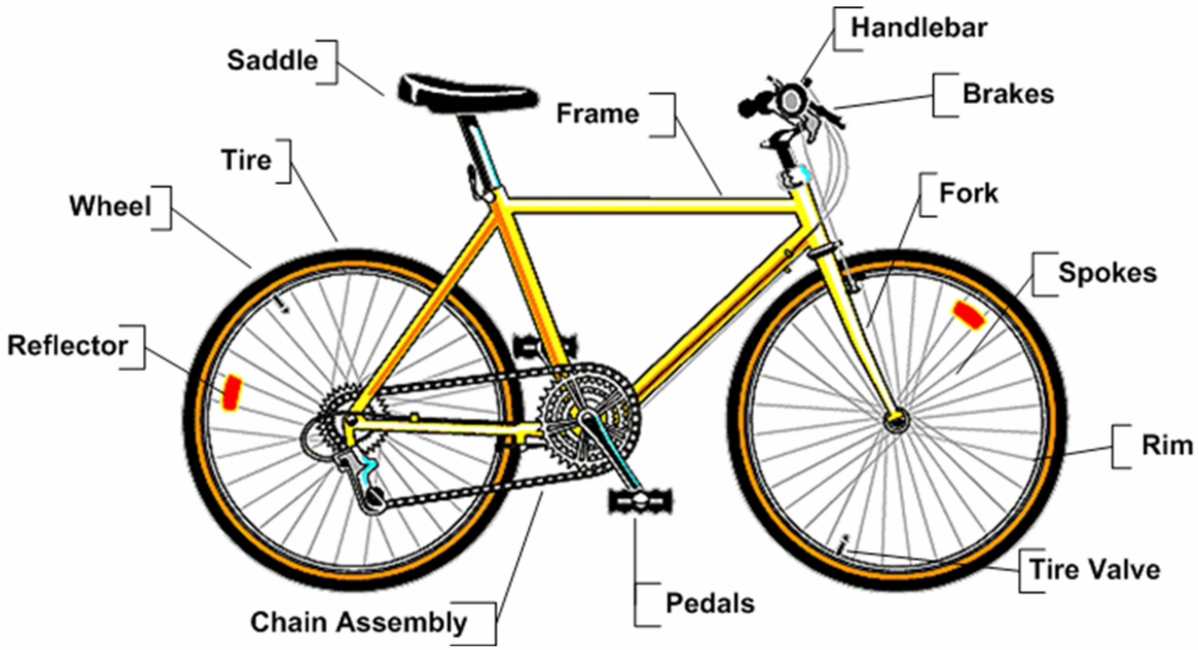
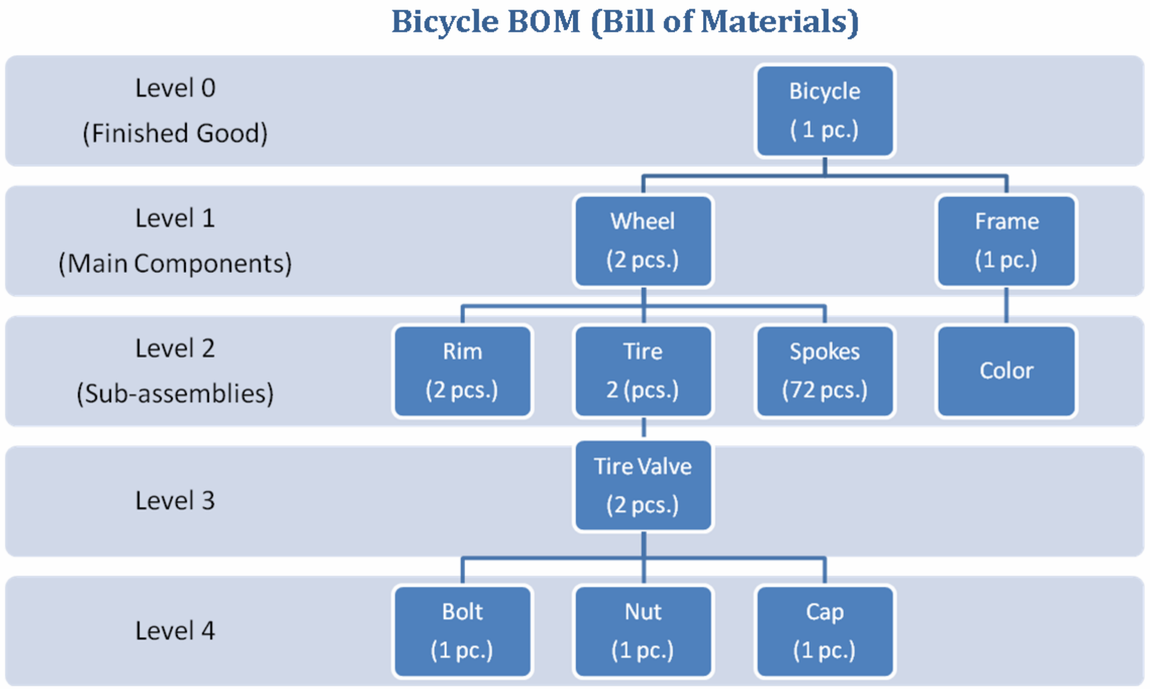
Bill of Material / Assembly Tree





Adapted from: CSBI, https://www.cbsi-corp.com/wp-content/uploads/2012/02/NA50_03_Bill_of_Materials2.pdf

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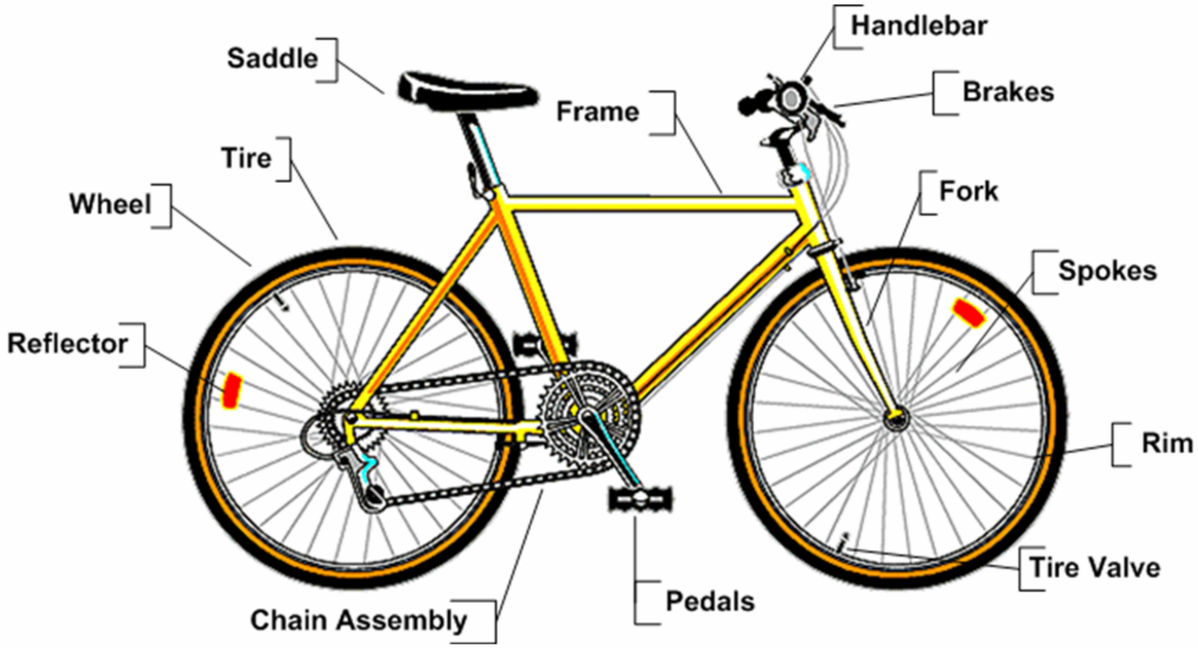

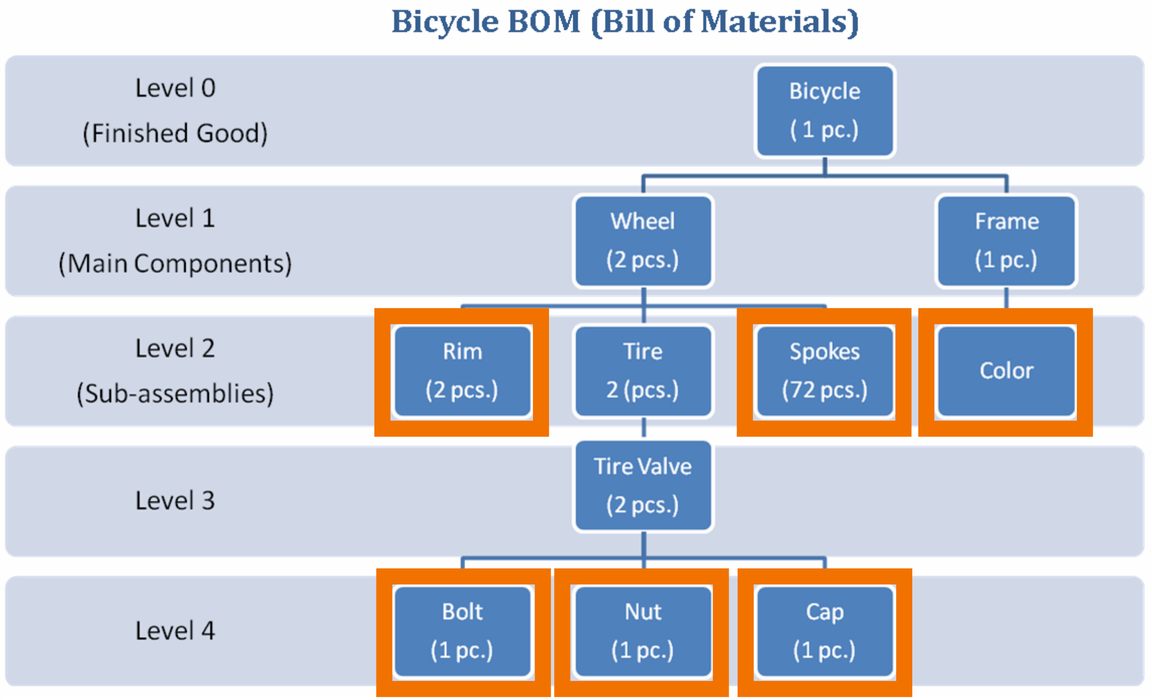

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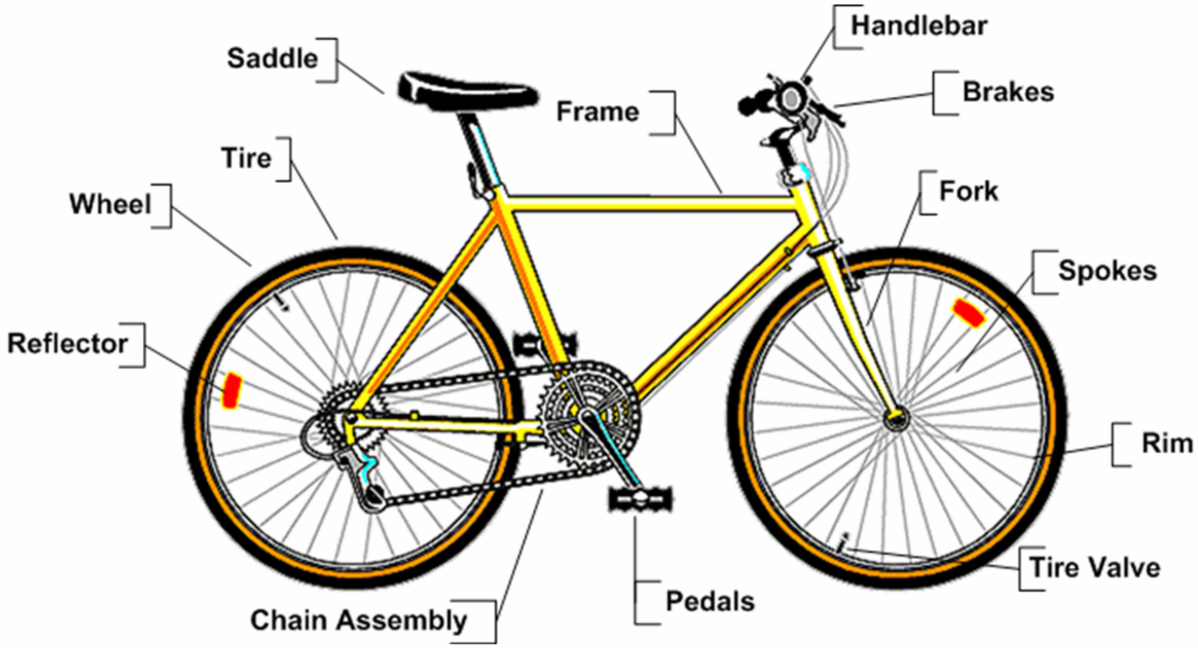

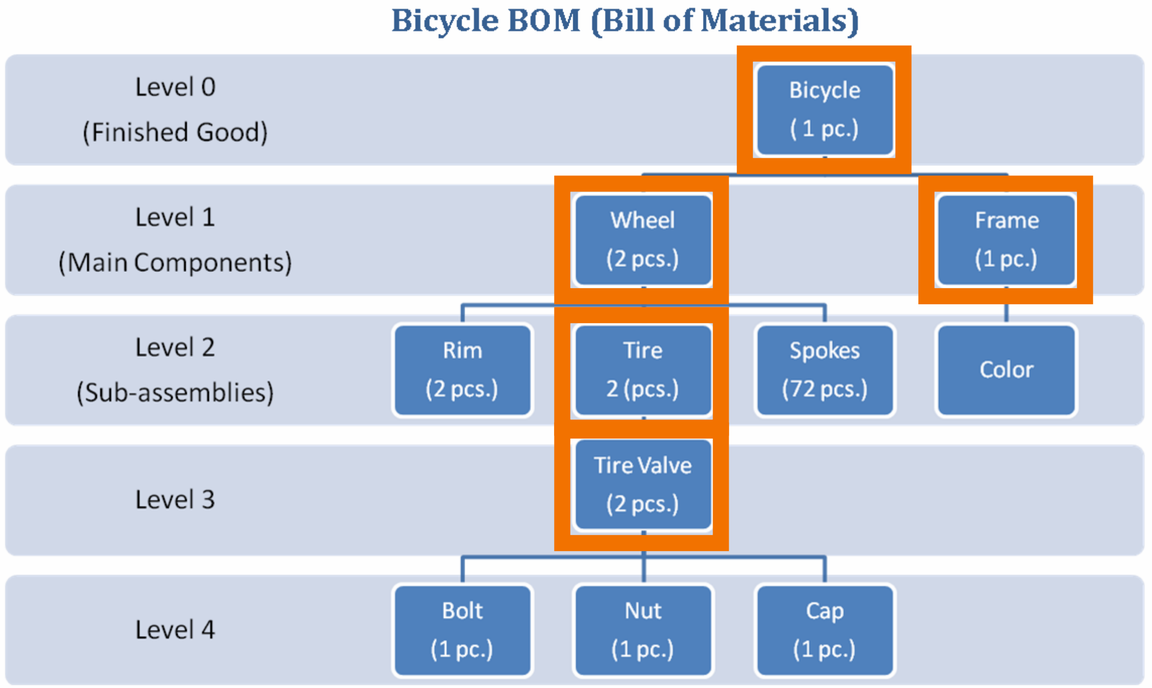

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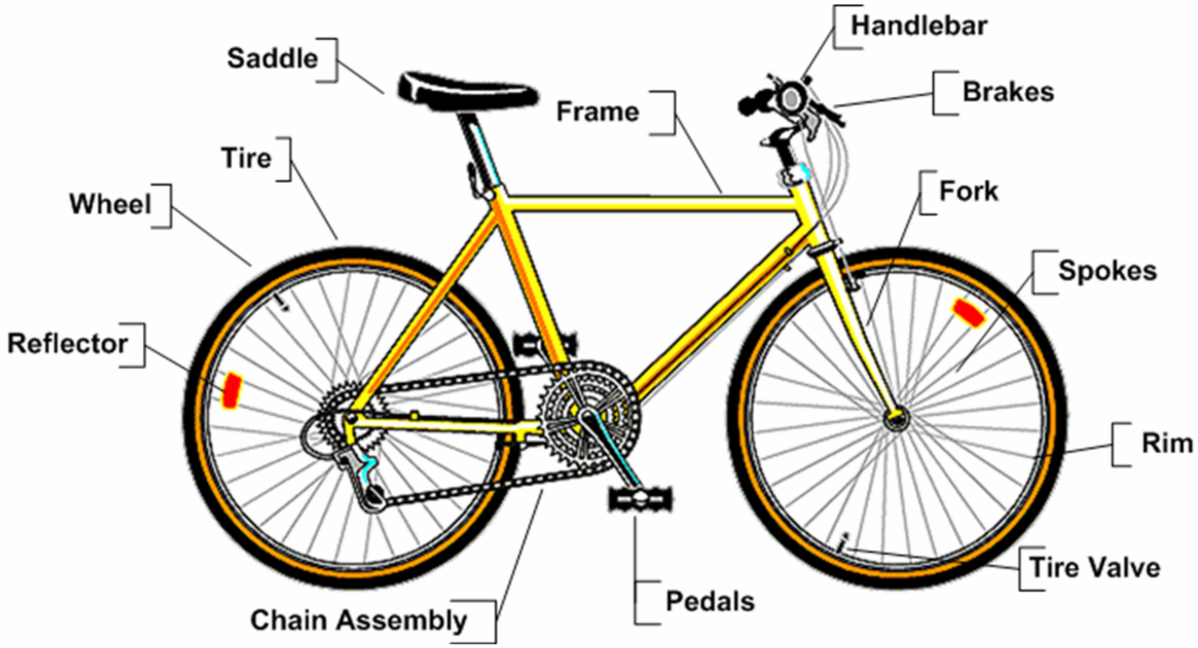

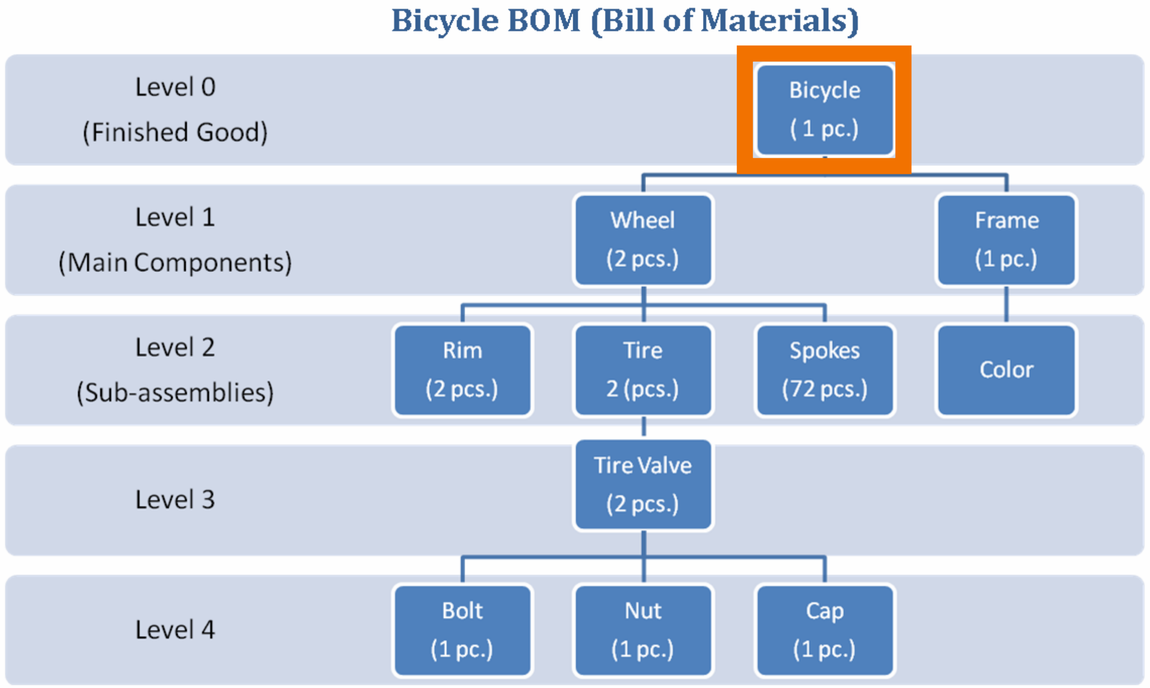

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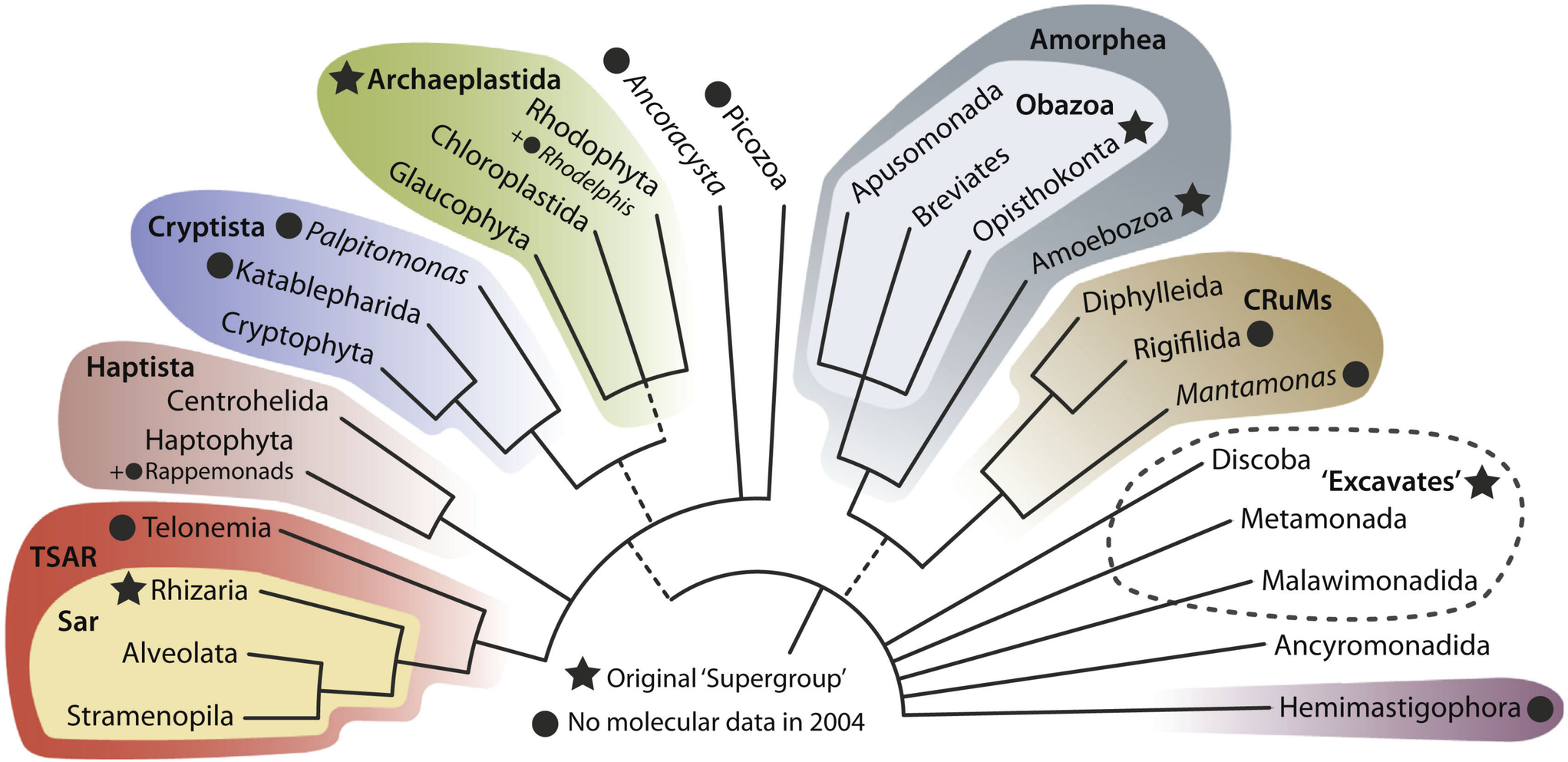
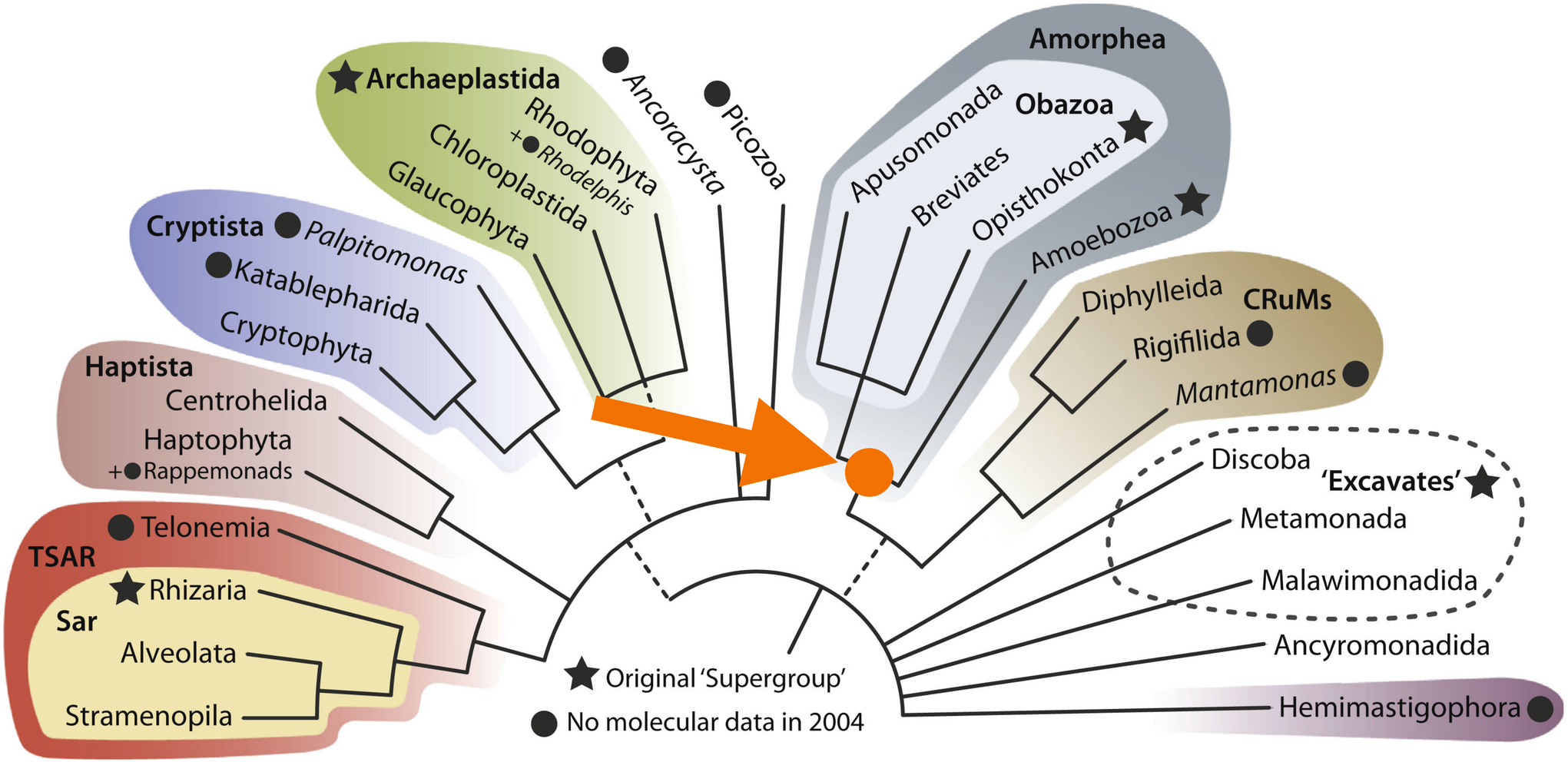
Phylogenetic Trees



Source: The New Tree of Eukaryotes, Burki, et al., Trends in Ecology and Evolution, 35(1), 2019

Phylogenetic Trees



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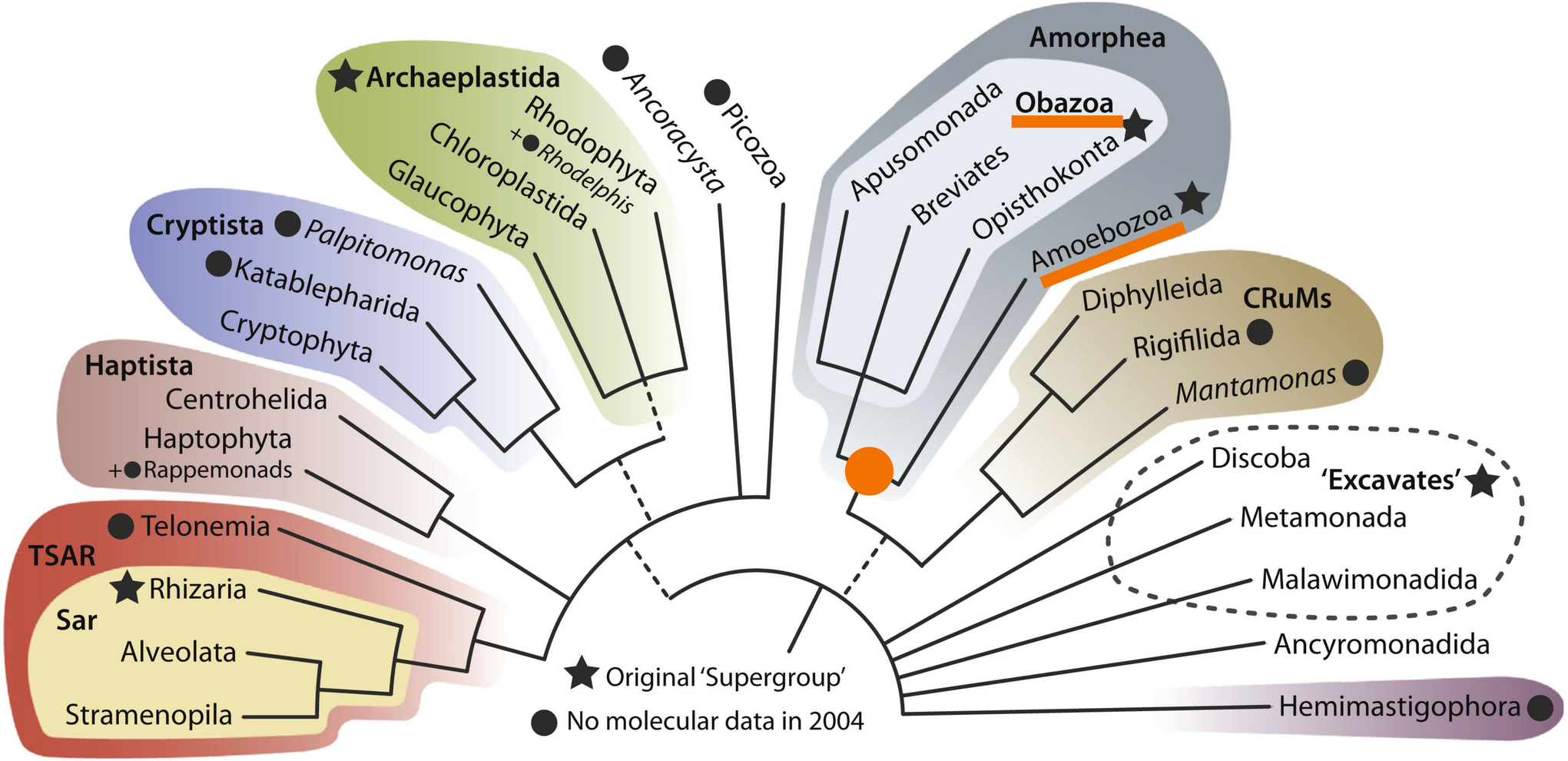

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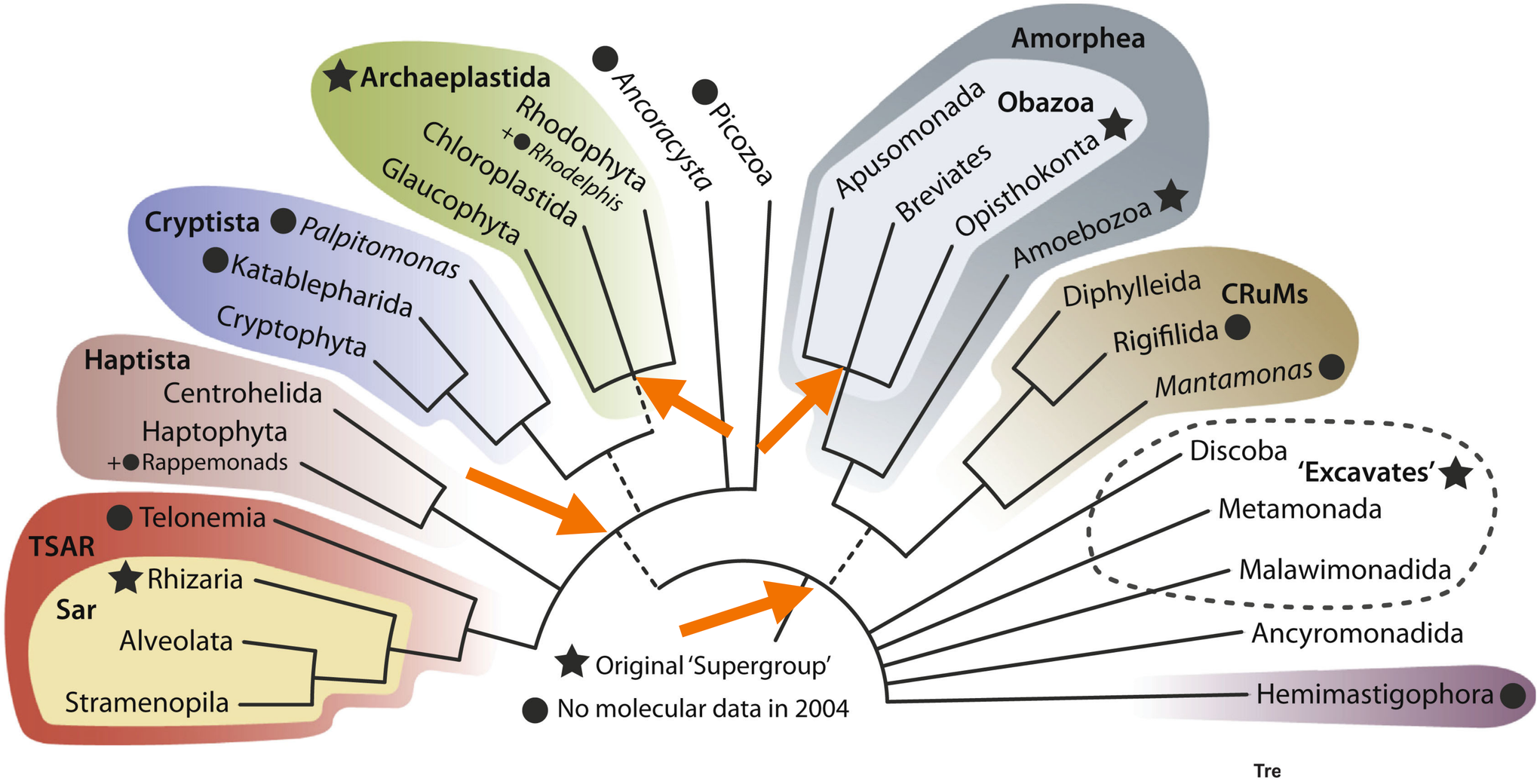

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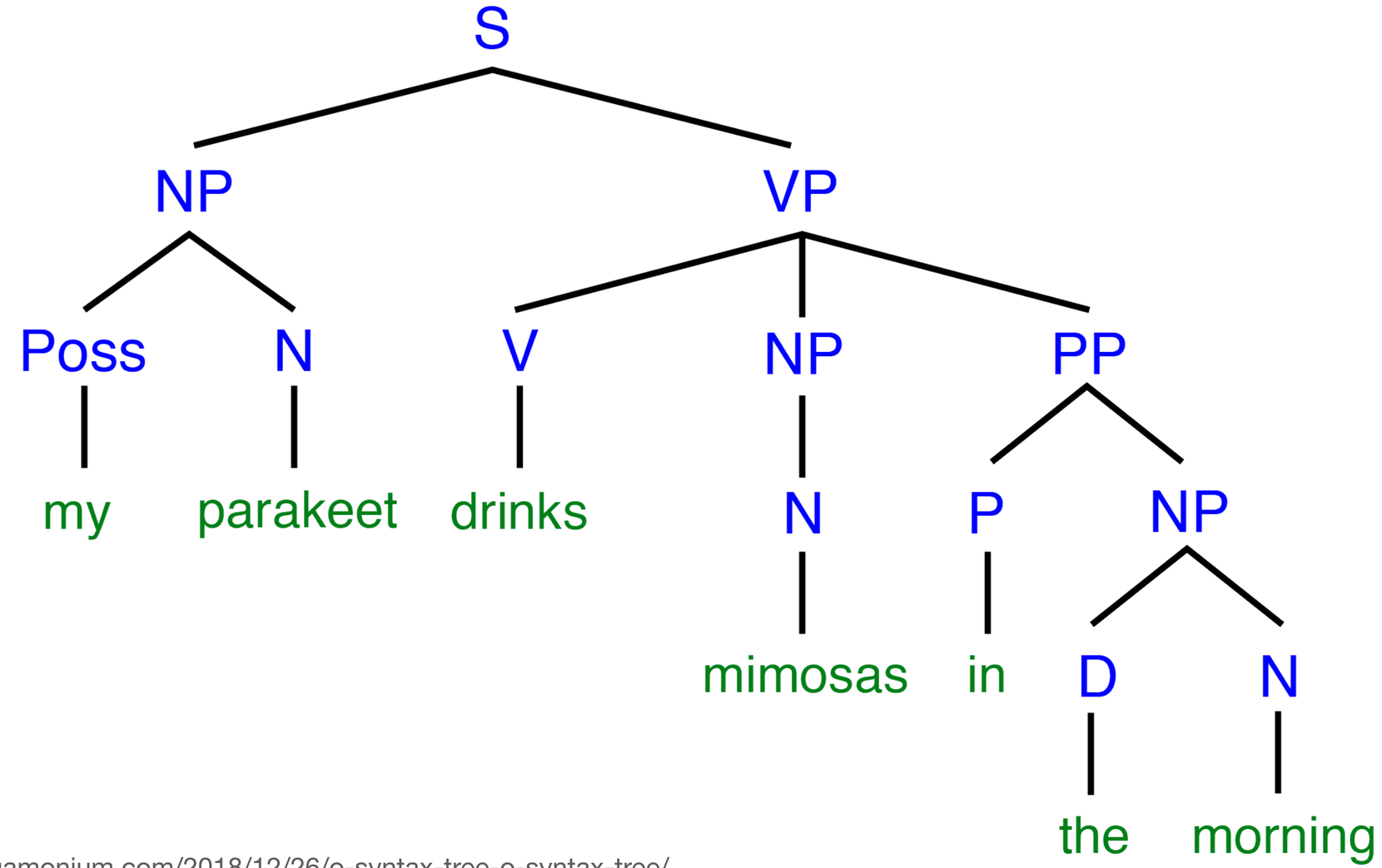
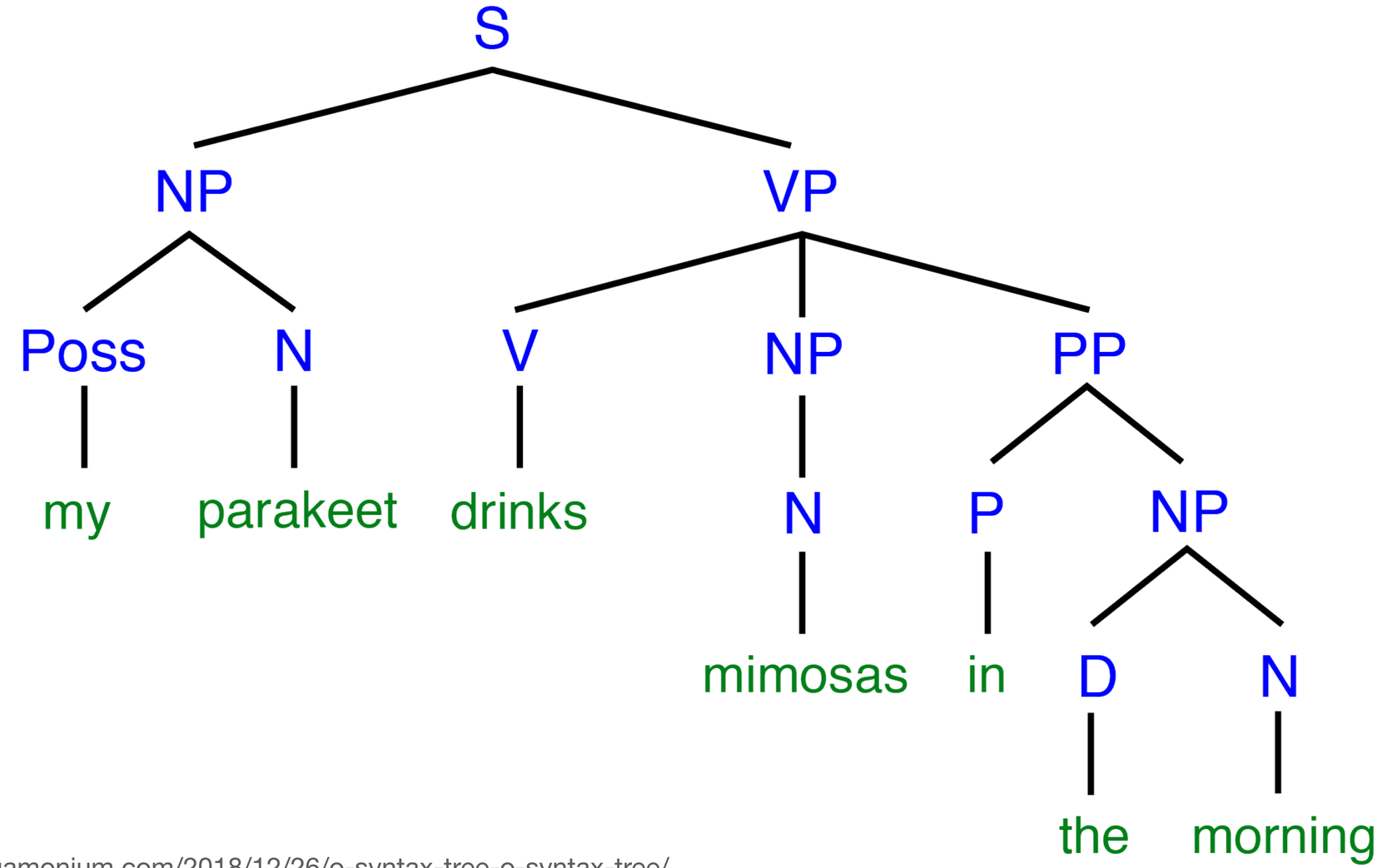
Parse Trees / Syntax Trees / NLP



Source: https://linguamonium.com/2018/12/26/o-syntax-tree-o-syntax-tree/

Parse Trees / Syntax Trees / NLP



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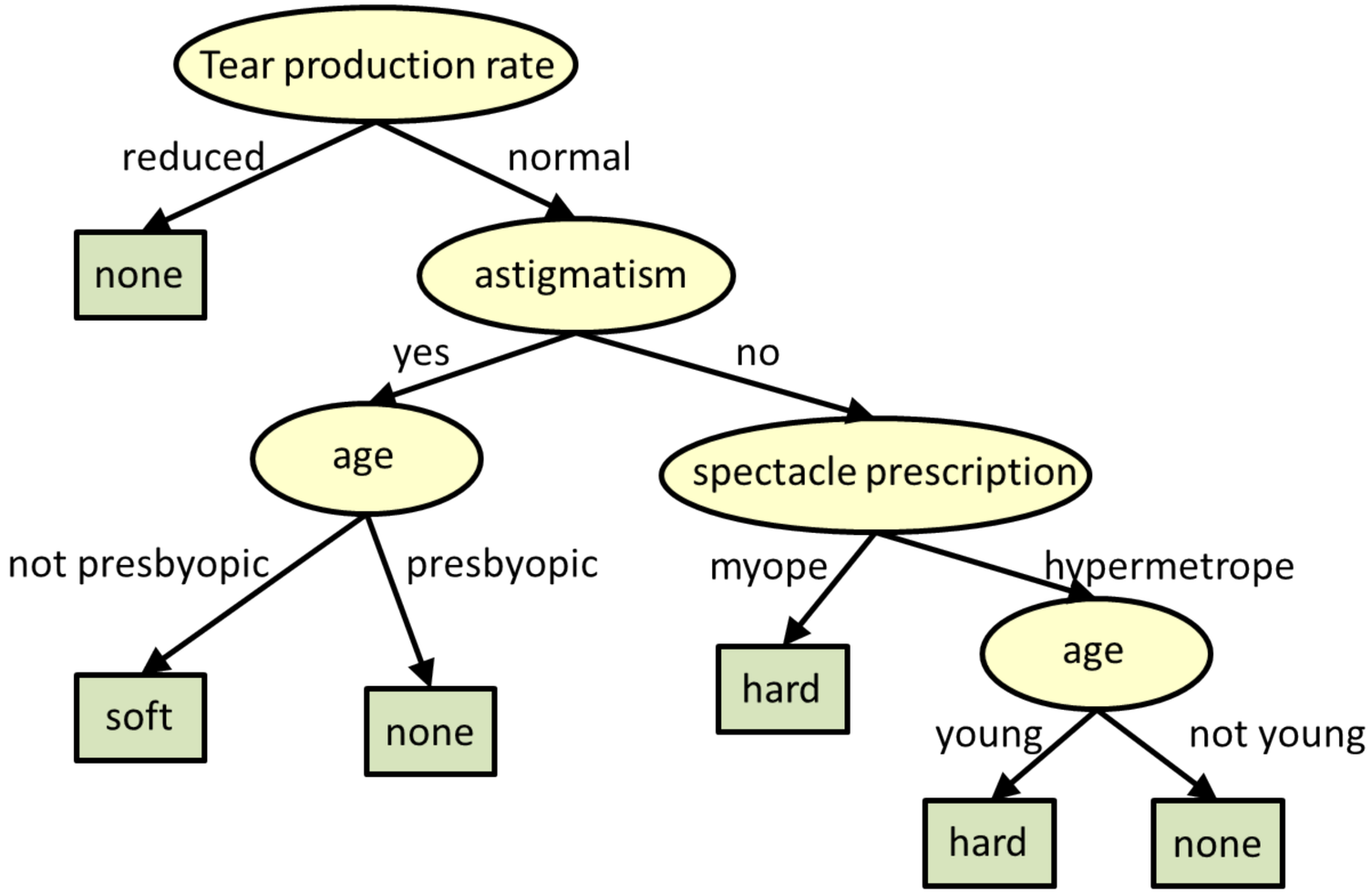
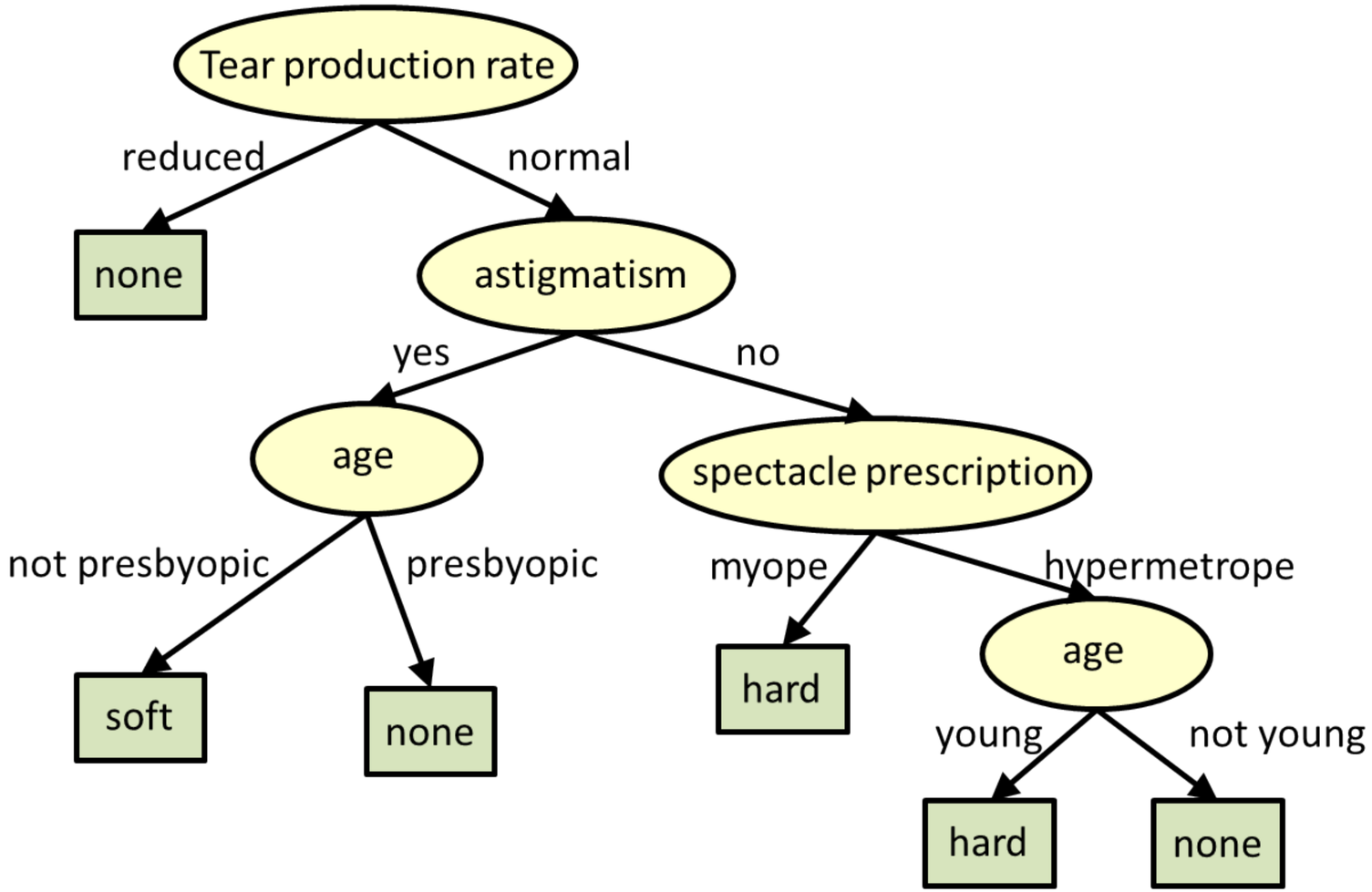
Decision Trees and Data Classification



Source: https://www.cs.cmu.edu/~bhiksha/courses/10-601/decisiontrees/

Decision Trees and Data Classification



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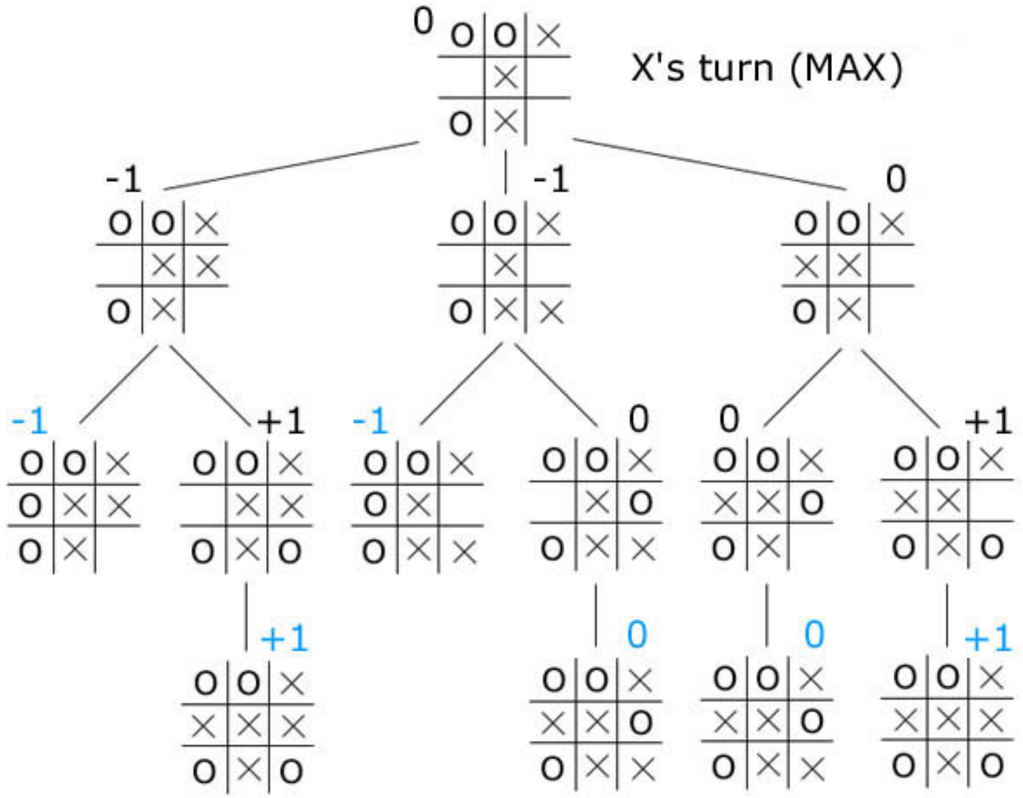
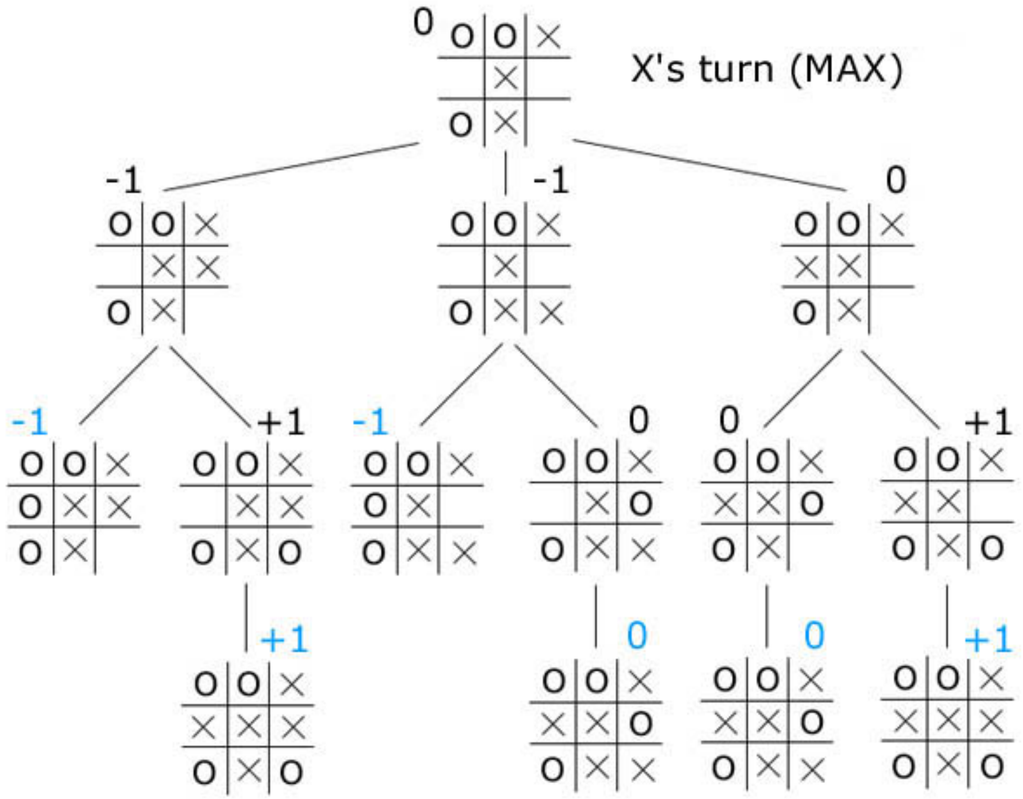
Game Trees / Artificial Intelligence



Source: https://www.ocf.berkeley.edu/~yosenl/extras/alphabeta/alphabeta.jpg

Game Trees / Artificial Intelligence



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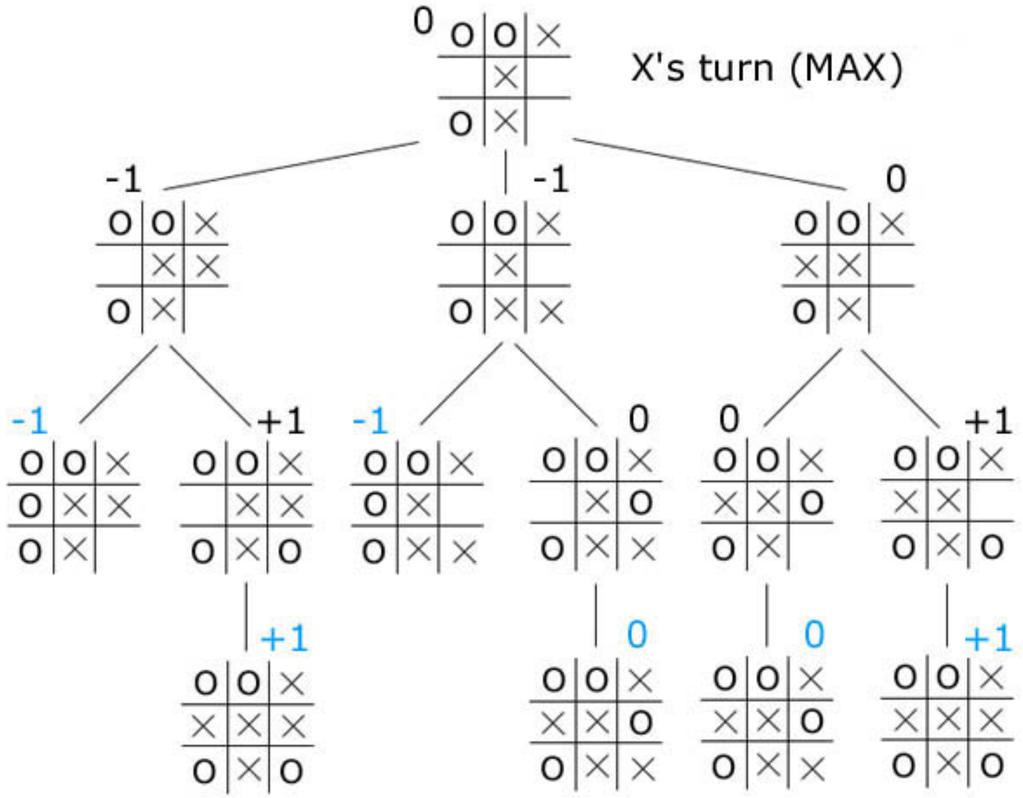

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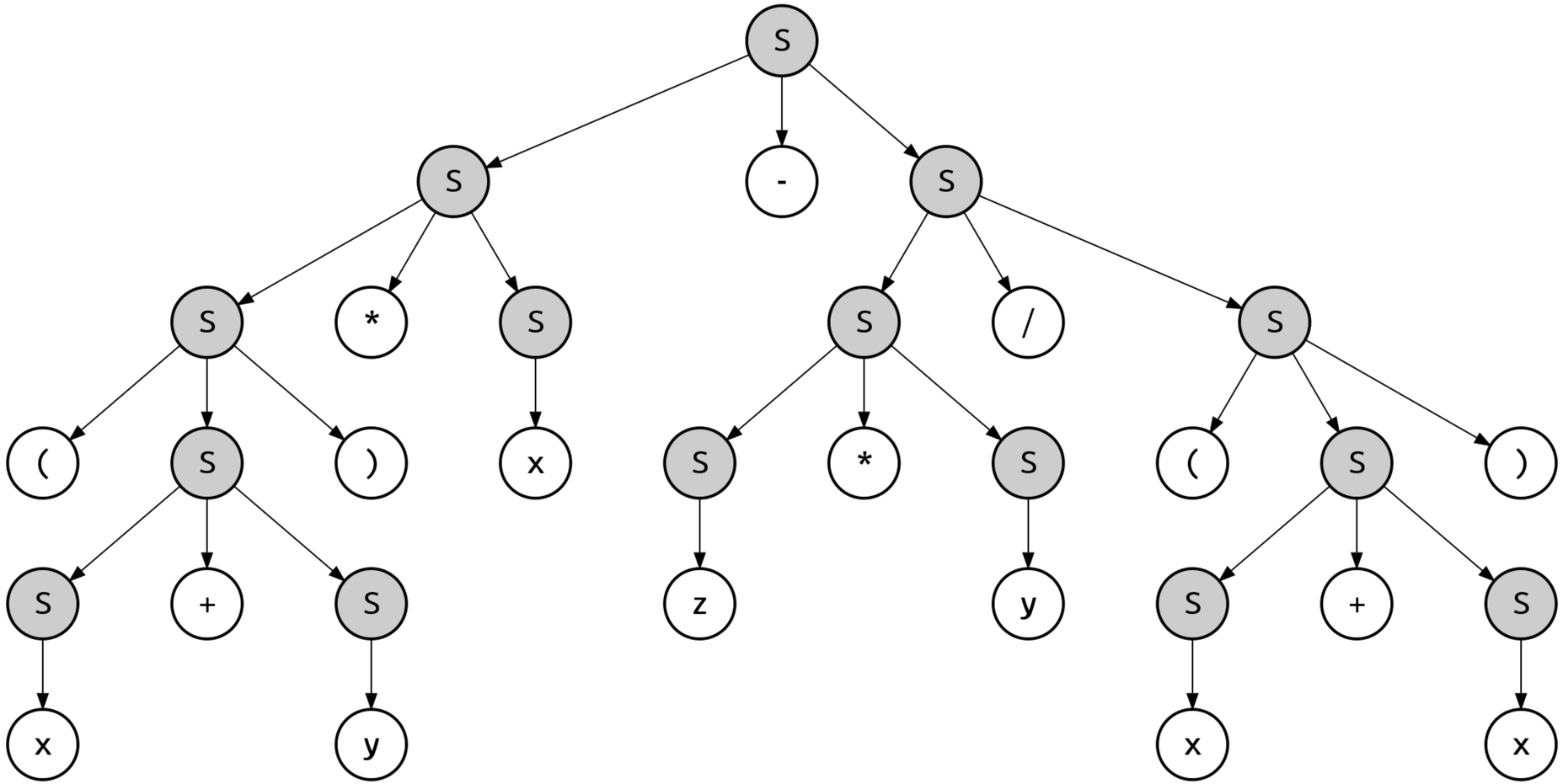
Context-free Grammars & Expression Trees



Source: https://en.wikipedia.org/wiki/Context-free_grammar#/media/File:Parse_Tree_1.svg

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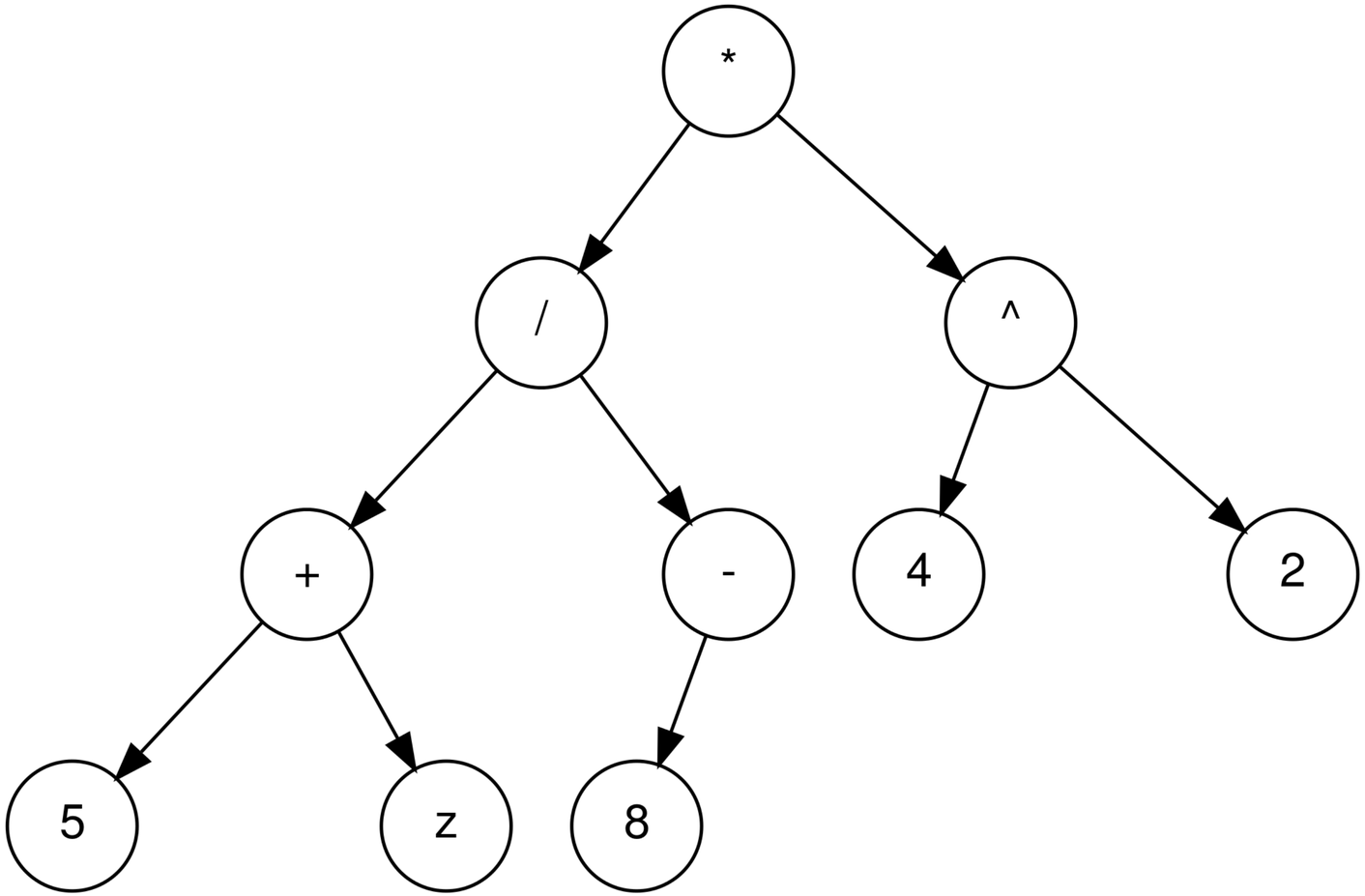
Context-free Grammars & Expression Trees



Source: https://en.wikipedia.org/wiki/Binary_expression_tree#/media/File:Exp-tree-ex-12.svg

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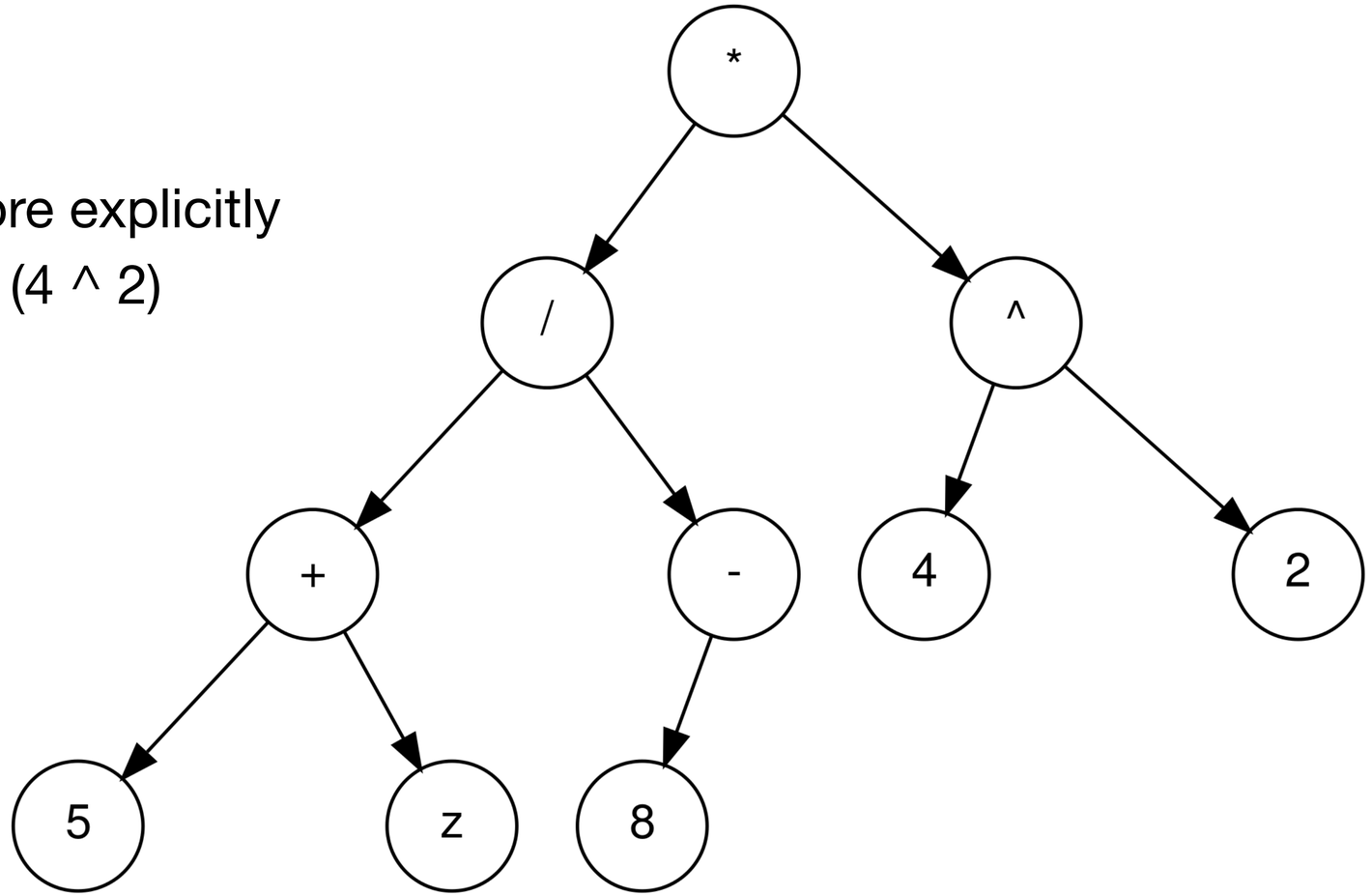
Context-free Grammars & Expression Trees

$$\frac{5+z}{-8} \times 4^2$$

or written more explicitly

((5 + z) / -8) * (4 ^ 2)



Source: https://en.wikipedia.org/wiki/Binary_expression_tree#/media/File:Exp-tree-ex-12.svg

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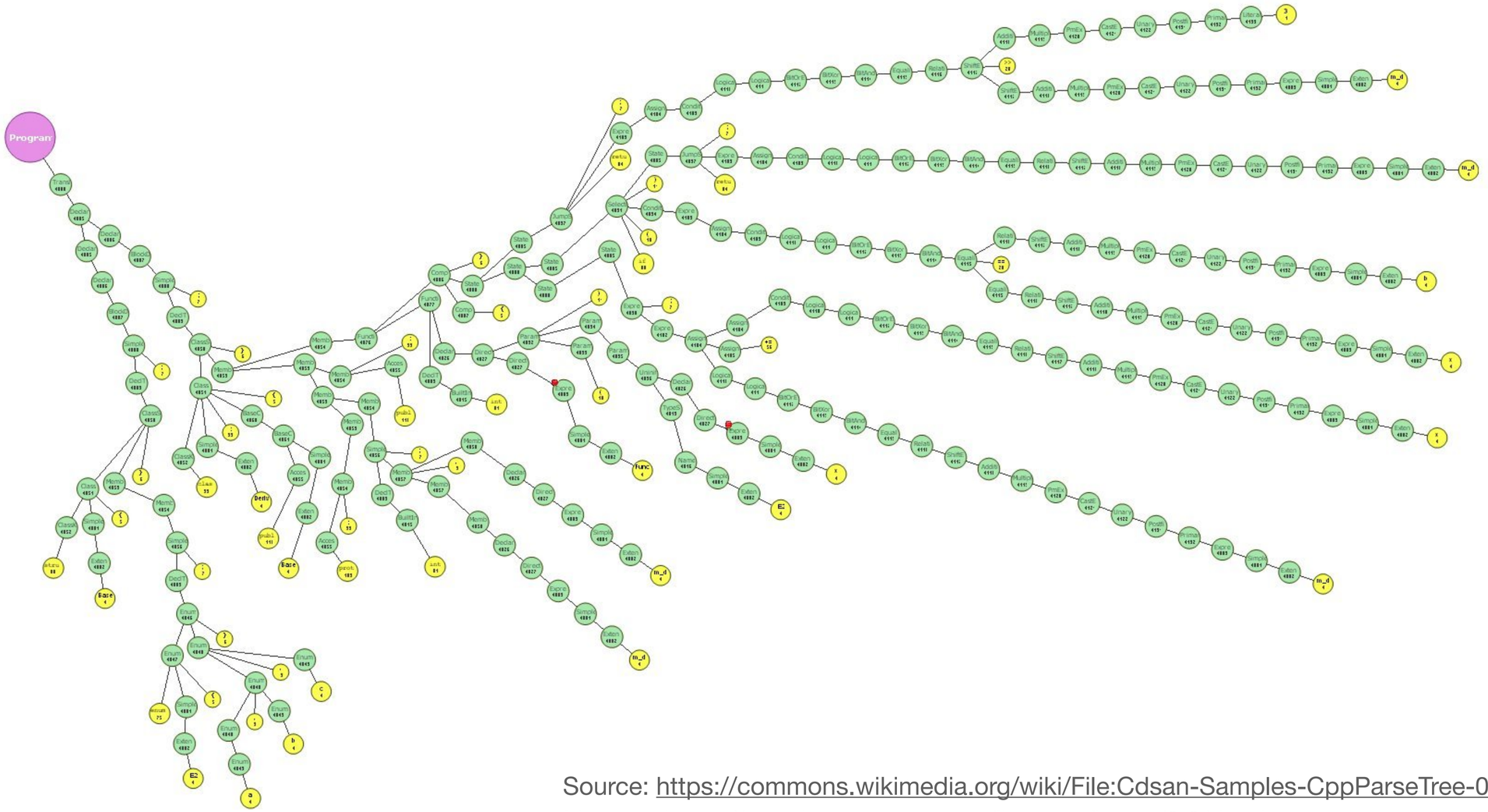
...even your C++ compiler



Source: https://commons.wikimedia.org/wiki/File:Cdsan-Samples-CppParseTree-01-HiRes.jpg

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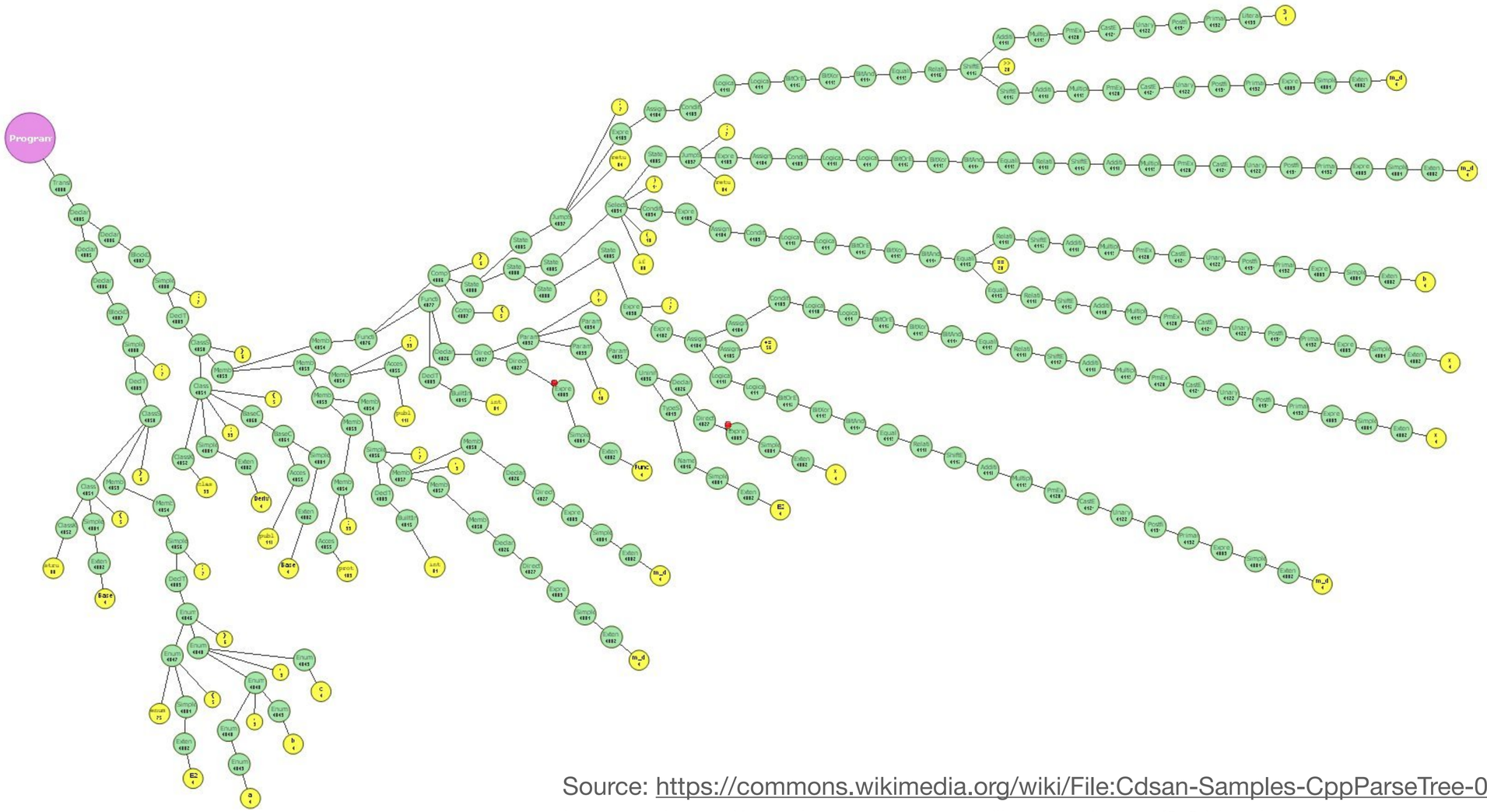

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