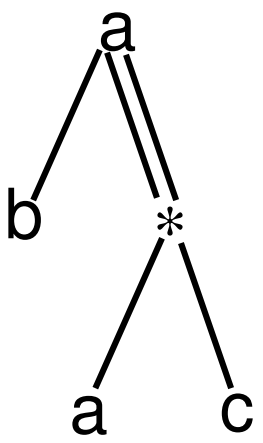
Minimization of Tree Pattern Queries

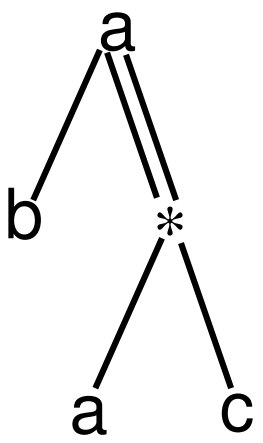
Paweł Parys

(Common work with Wojciech Czerwiński,
Wim Martens, Matthias Niewerth)

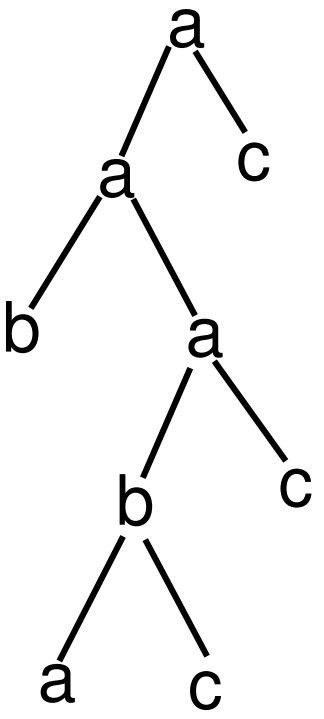
tree pattern

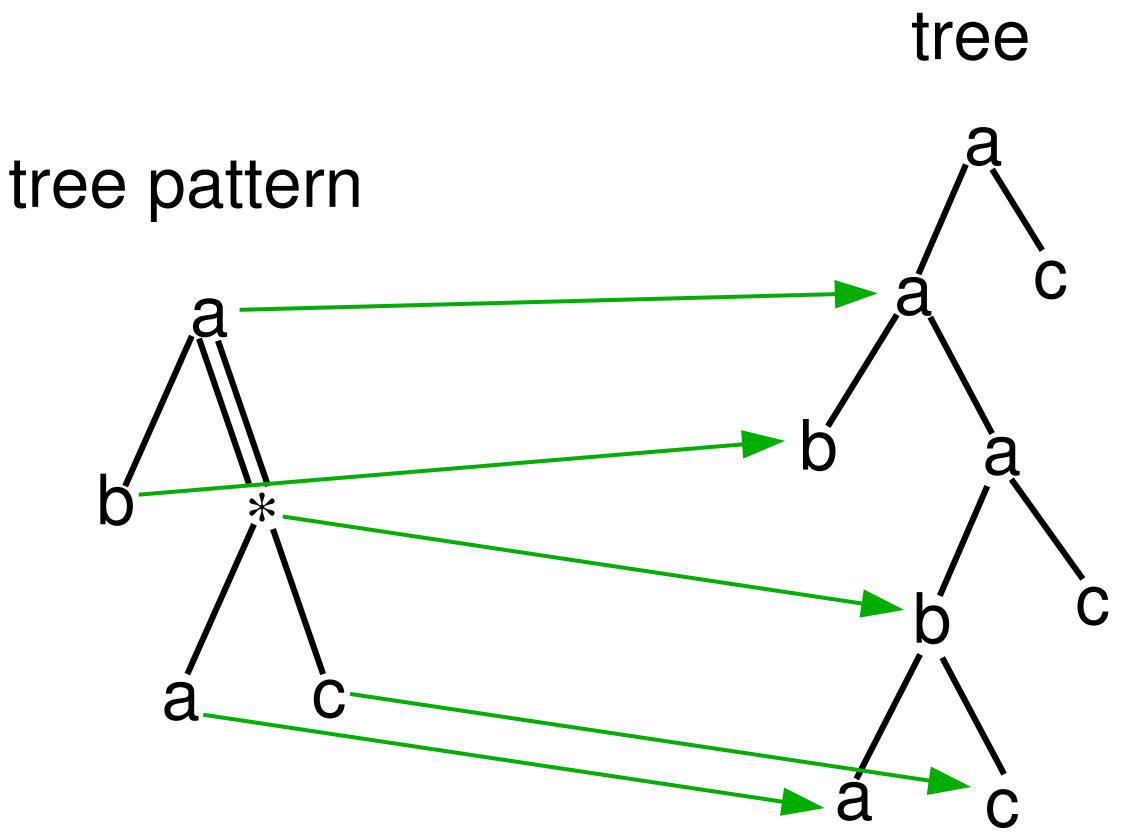


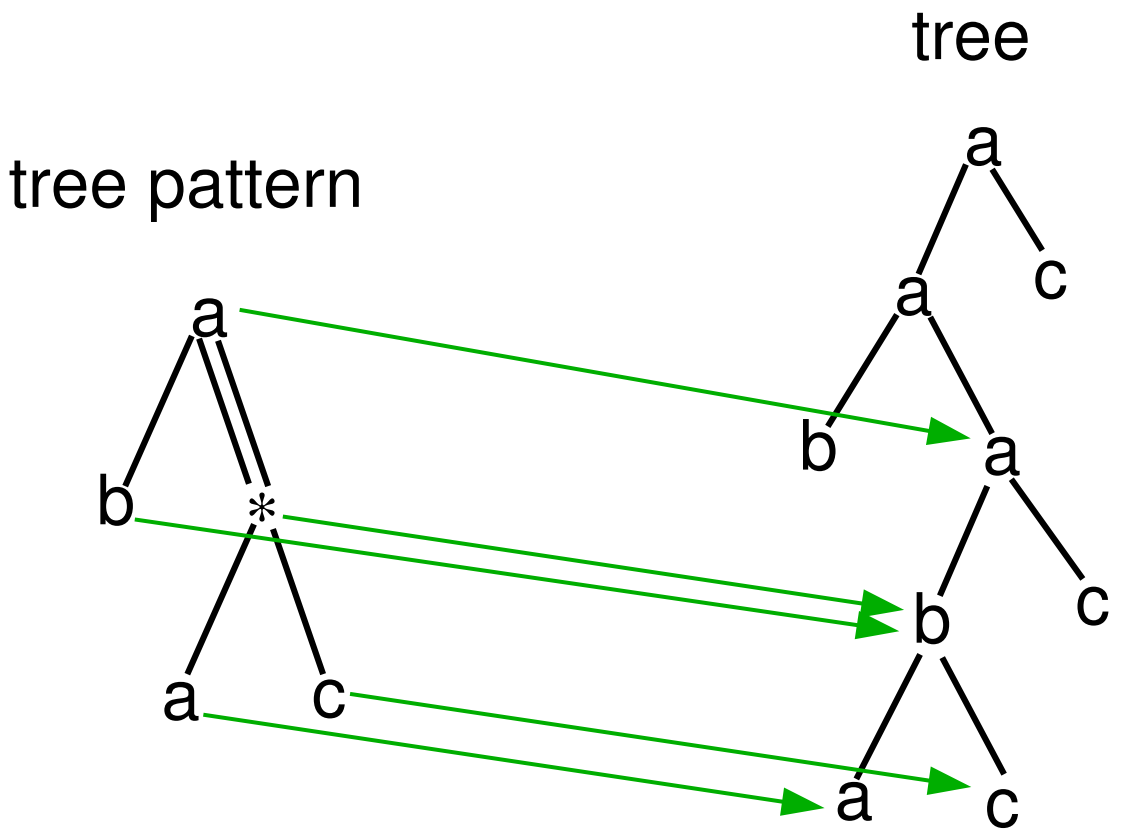
tree pattern

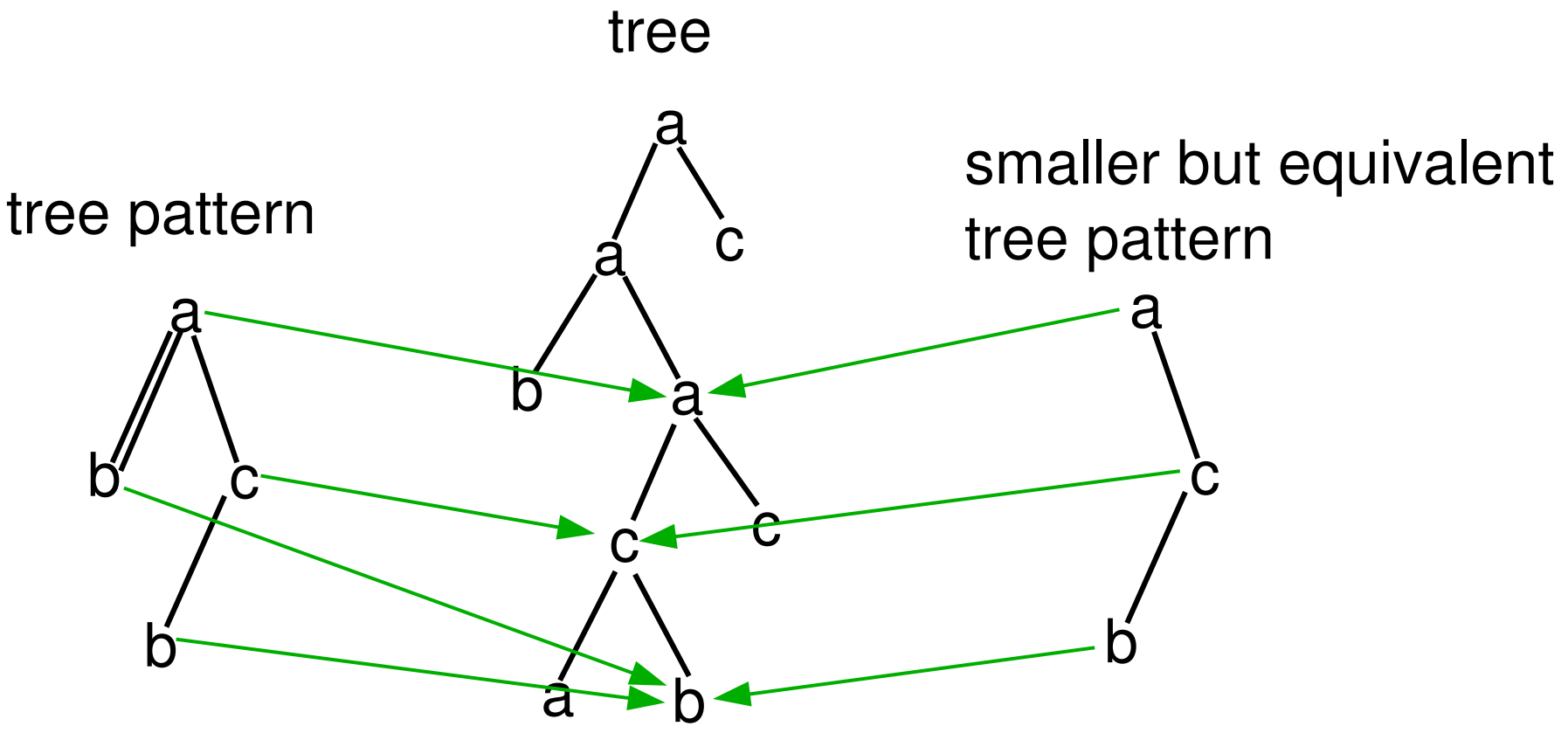


tree

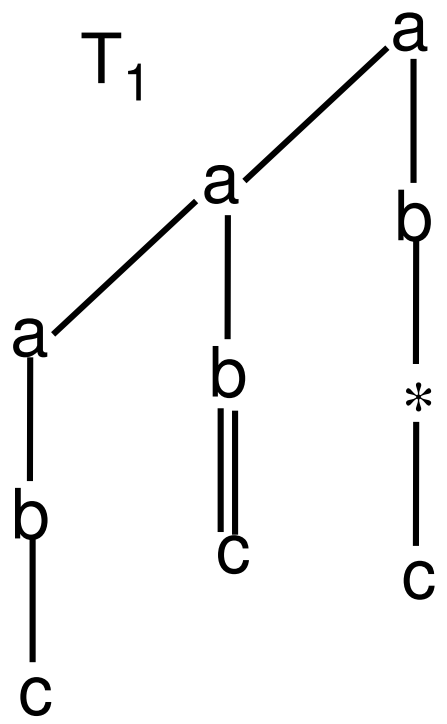


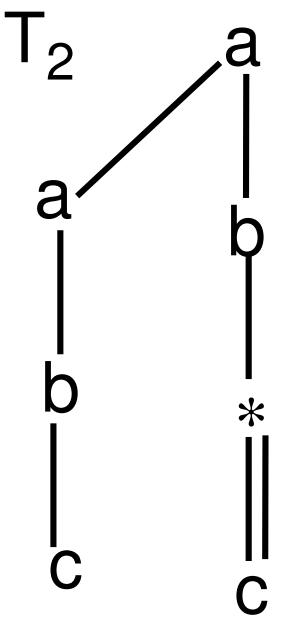

tree
tree pattern
a
b
*
a
c
a
c
b
a
b
c
a
c


tree
tree pattern
a
b
*
a
c
a
c
b
a
b
c
a
c


tree
tree pattern
smaller but equivalent
tree pattern
a
a
c
b
a
a
b
c
c
c
b
a
b
b

More complicated example:





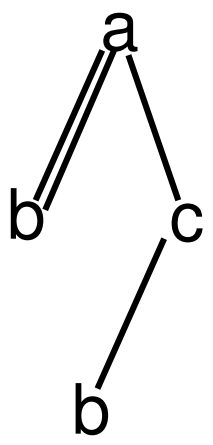
T_2 matches every tree matched by T_1

but there is no mapping from T_2 to T_1

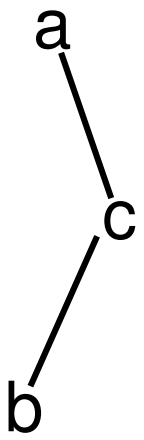
(no equivalence, inclusion only)

Minimality problem:
find the smallest tree pattern equivalent to T.

tree pattern T



smaller but equivalent tree pattern



Hypothesis (2003): to minimize a tree pattern, it is enough to remove some nodes.

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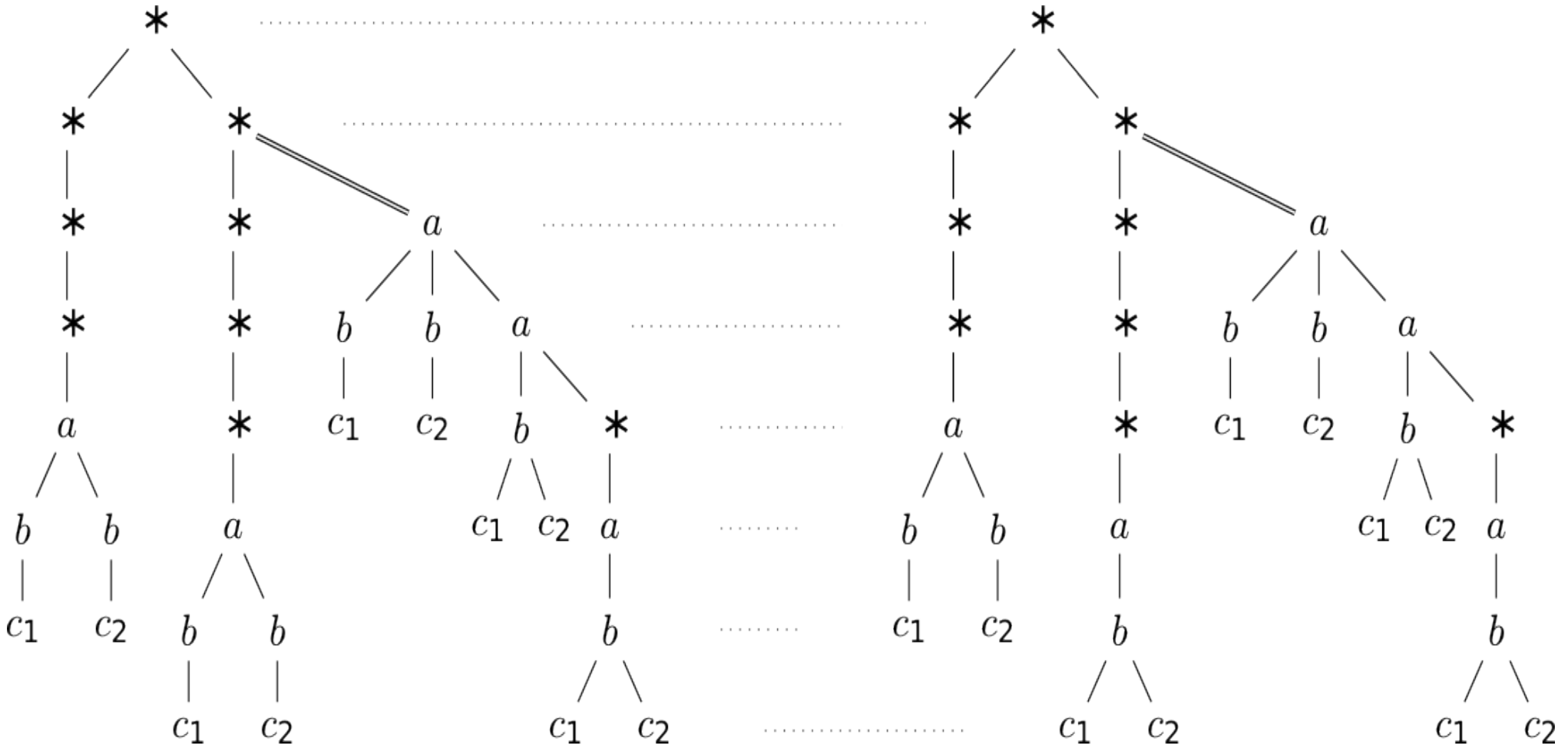
FALSE!!!



Contribution 1: These two tree patterns are equivalent and nonredundant!

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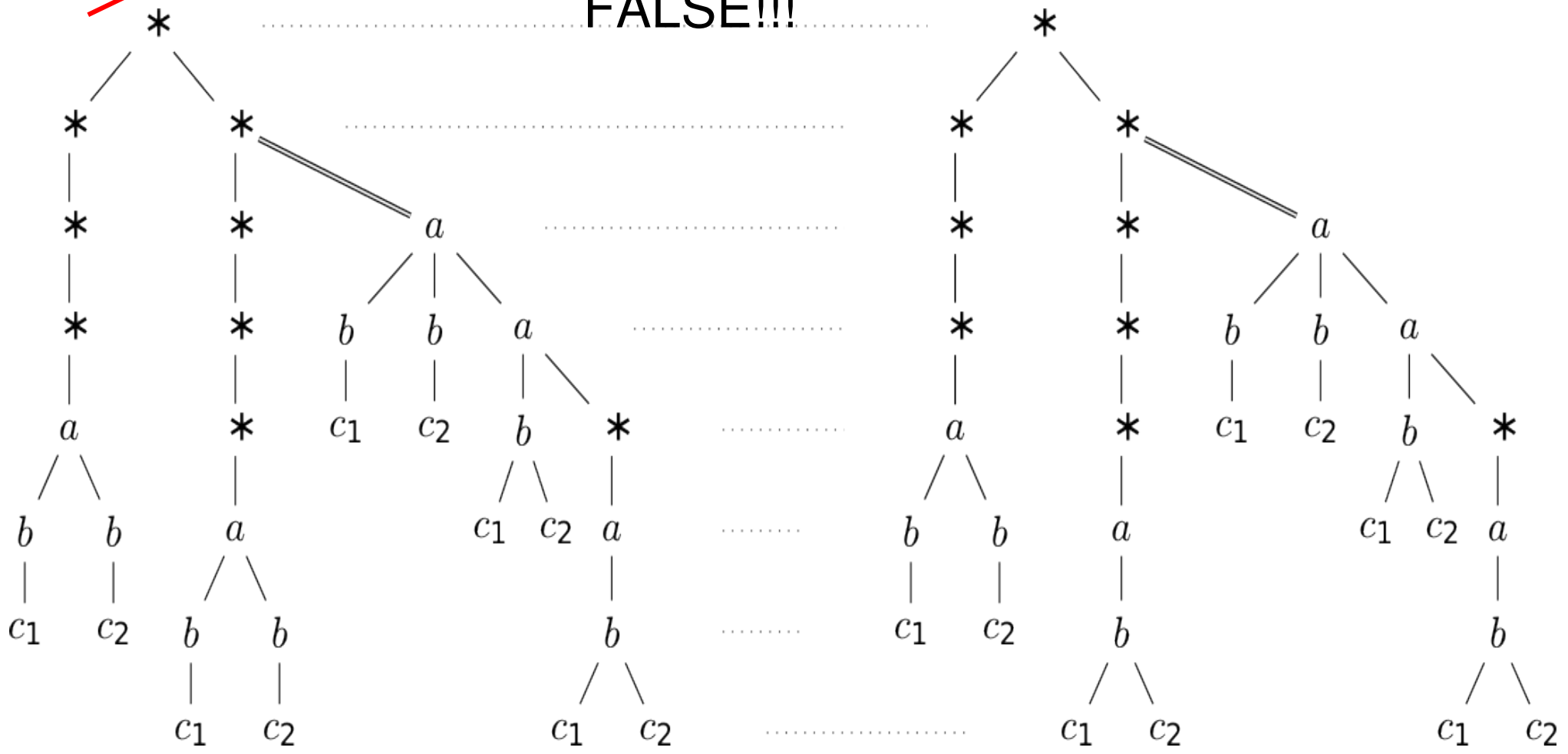

Contribution 1: These two tree patterns are equivalent and nonredundant!

Contribution 2: The minimality problem is Π_2^P-complete.