

Automated Theorem Proving

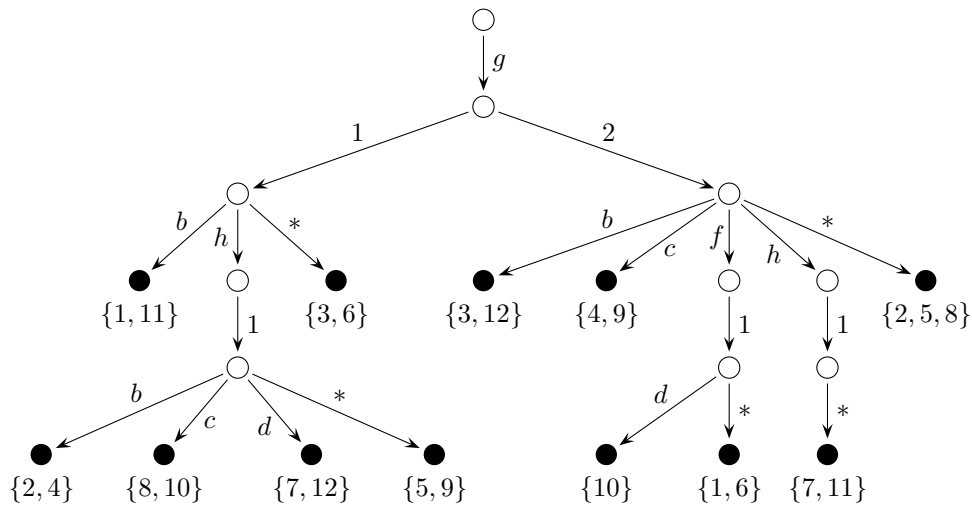
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based on exercises by Dr. Uwe Waldmann

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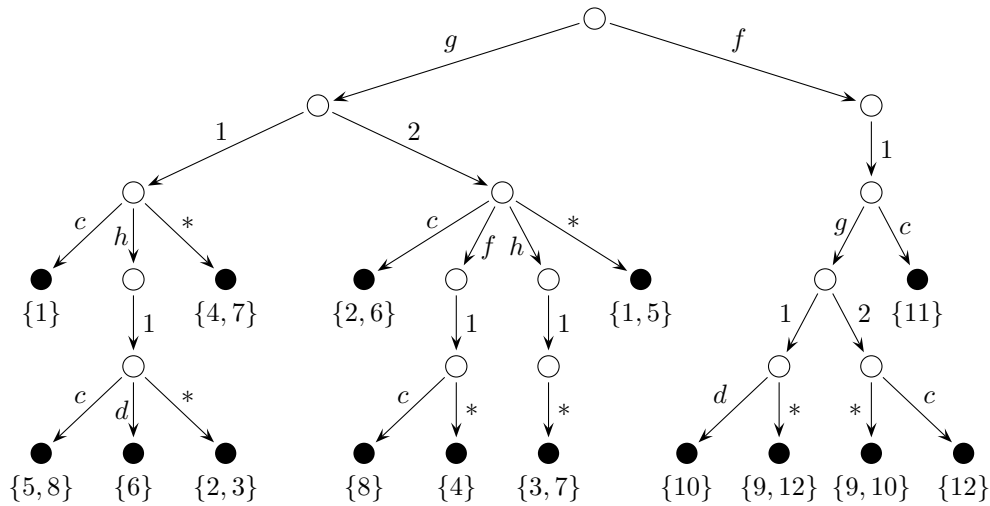
Exercises 14: Efficient Saturation Procedures and Outlook

Exercise 14.1: Consider the following path index:



Does path index contain the terms $t_1 = g(h(d), h(*))$, $t_2 = g(h(b), c)$, $t_3 = g(*, *)$? If yes, what are their numbers in the index?

Exercise 14.2: Consider the following path index:



- (a) Which terms have the numbers 3, 5, and 12 in the path index?
- (b) Which of the terms $g(*, h(*))$, $f(g(d, c))$, and $g(h(*), c)$ are contained in the path index? If they are contained, what are their numbers?
- (c) Assume that the terms in the path index are the left-hand sides of the rewrite rules of a TRS R . Is the term $f(g(h(d), f(c)))$ reducible by rules in R ? If yes, what are the numbers of the left-hand sides of these rules?

Exercise 14.3: Could one use the following numbers as features in a feature vector index?

- (1) the number of ground arguments of predicate symbols in a clause,
- (2) the number of variable occurrences in a clause,
- (3) the number of constant symbols occurring in positive literals in a clause,
- (4) the number of literals in a clause that do not contain variables,
- (5) the number of literals in a clause that do not contain the function symbol f ,
- (6) the number of literals in a clause that do not contain the predicate symbol P ,
- (7) the number of literals in a clause that contain neither variables nor the function symbol f ,
- (8) the number of distinct variables in a clause.