COMP 410 Lecture 1

Kyle Dewey

About Me

- I research automated testing techniques and their intersection with CS education
- My dissertation used logic programming extensively
- This is my fourth time teaching this class

About this Class

- See something wrong? Want something improved? Email me about it! (kyle.dewey@csun.edu)
- I generally operate based on feedback

Bad Feedback

- This guy sucks.
- This class is boring.
- This material is useless.

Good Feedback

- This guy sucks, *I can't read his writing.*
- This class is boring, *it's way too slow.*
- This material is useless, *I don't see how it relates to anything in reality.*

- I can't fix anything if I don't know what's wrong

What is Logic Programming?

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- What, not how

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- What, not how
- No mutable state

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- What, not how
- No mutable state
- Basis in formal logic
  - = means =

What is Logic Programming?

- What, not how
- No mutable state
- Basis in formal logic
  - = means =
- Line between input/output is blurry

What is this Course?

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- Programming, programming, programming

What is this Course?

- Programming, programming, programming
- Thinking in a logic programming way

What is this Course?

- Programming, programming, programming
- Thinking in a logic programming way
- Applying logic programming without a logic programming language

What this course **isn't**

What this course **isn't**

- Artificial intelligence

What this course **isn't**

- Artificial intelligence
- Machine learning

What this course **isn't**

- Artificial intelligence
- Machine learning
- Theoretical

Syllabus

Outline

- Abstract Syntax Trees and evaluation
- SAT and Semantic Tableau

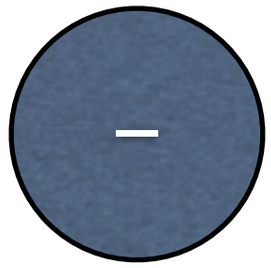
Abstract Syntax Trees and Evaluation

Abstract Syntax Tree

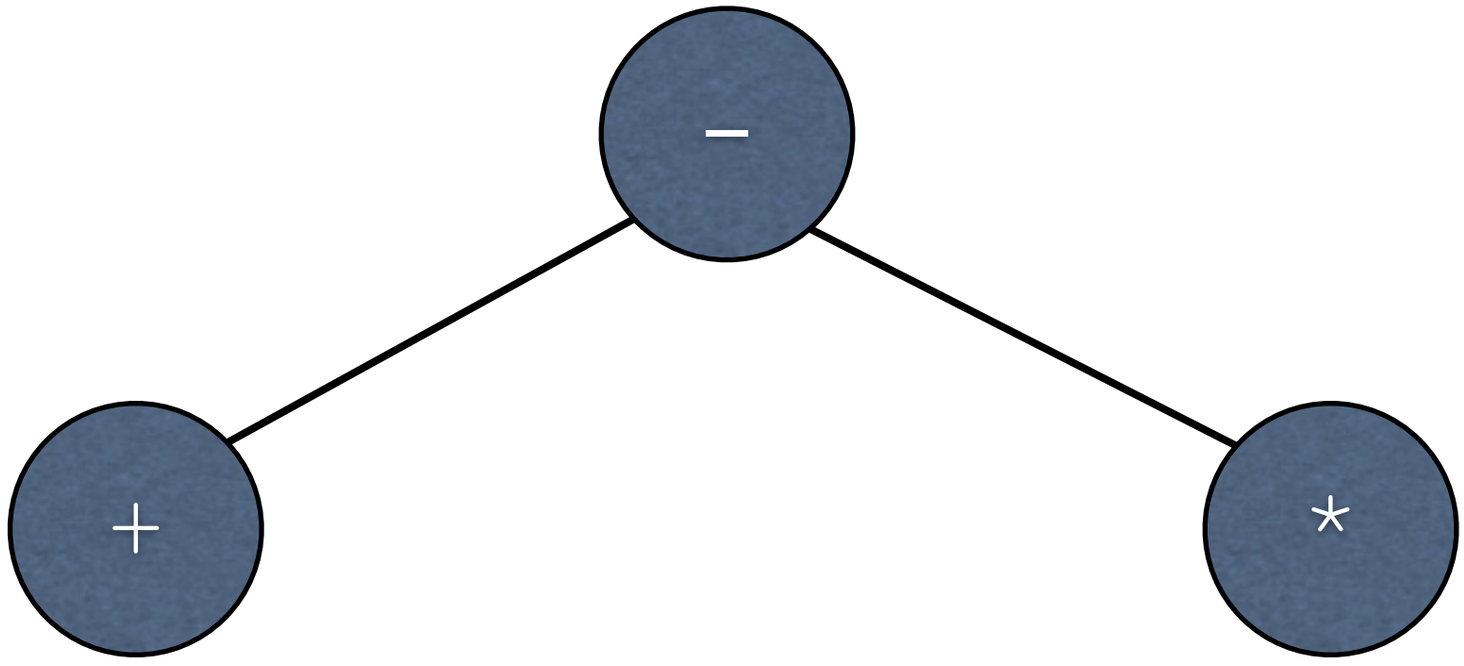
- Abbreviation: AST
- Unambiguous tree-based representation of a sentence in a language
- Very commonly used in compilers, interpreters, and related software

$$(1 + 2) - 3 * 4$$

(1 + 2) − 3 * 4



(1 + 2) - 3 * 4



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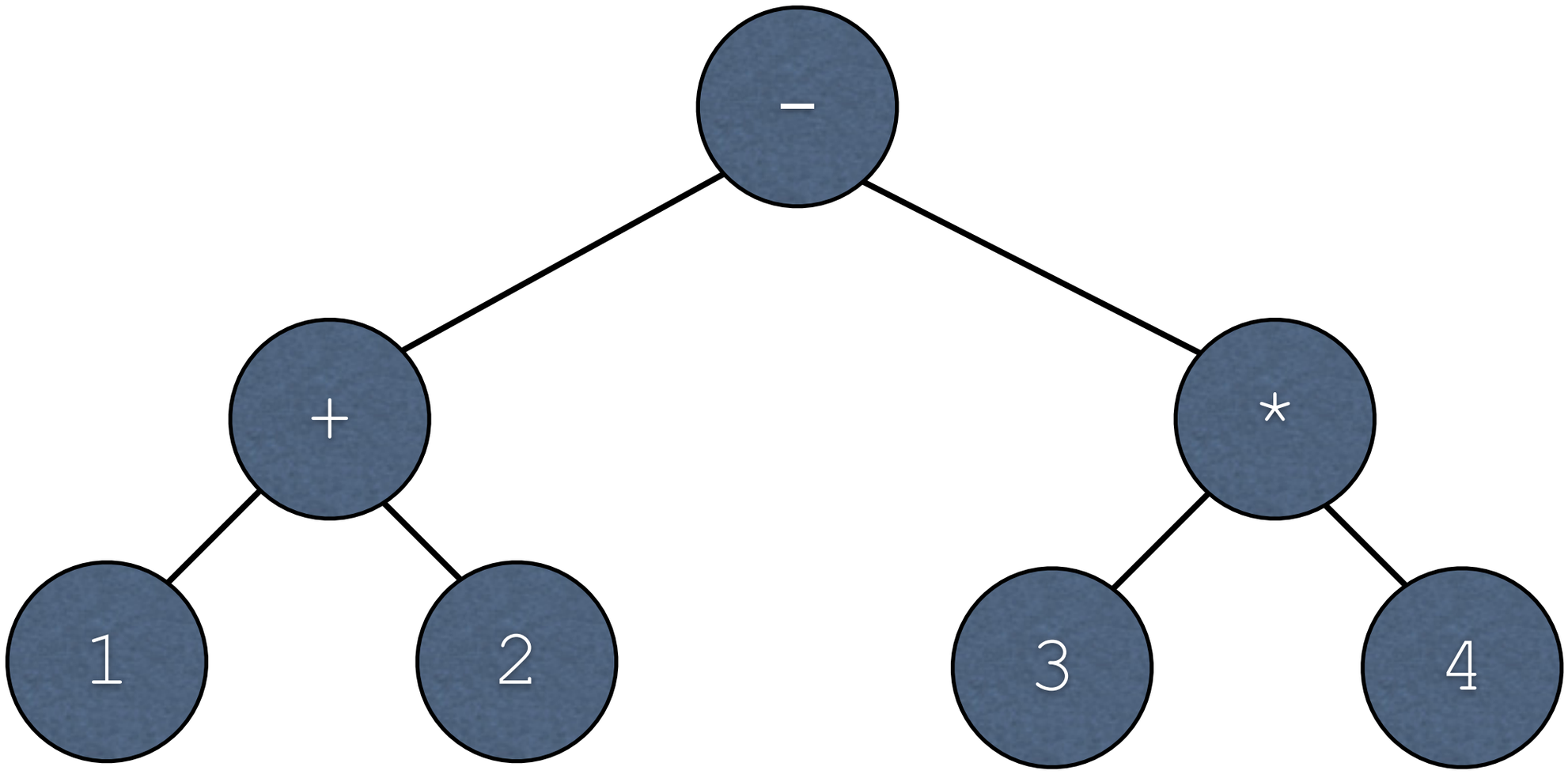
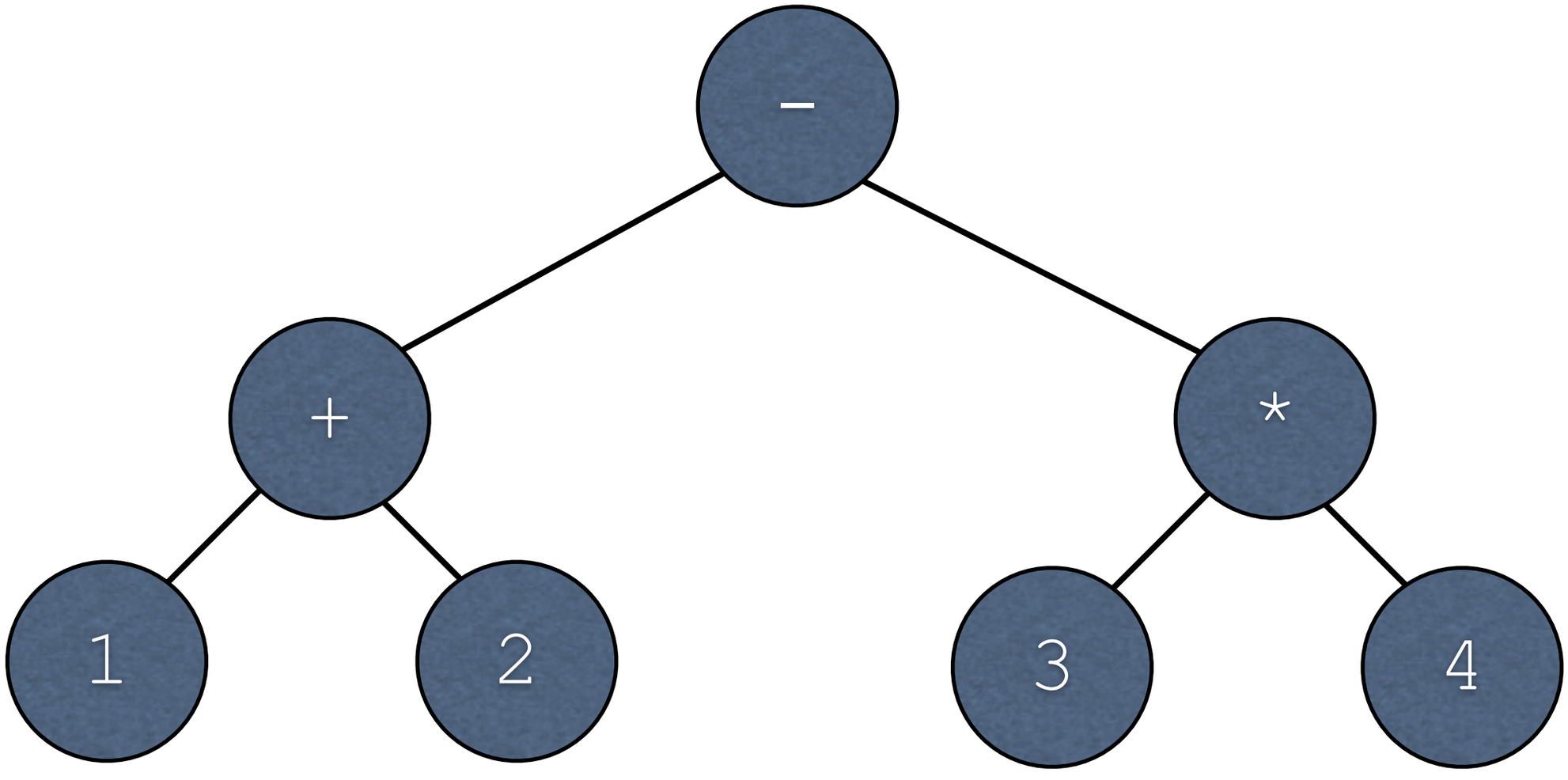


Exercise: First Side of AST/Evaluation Sheet

Evaluation



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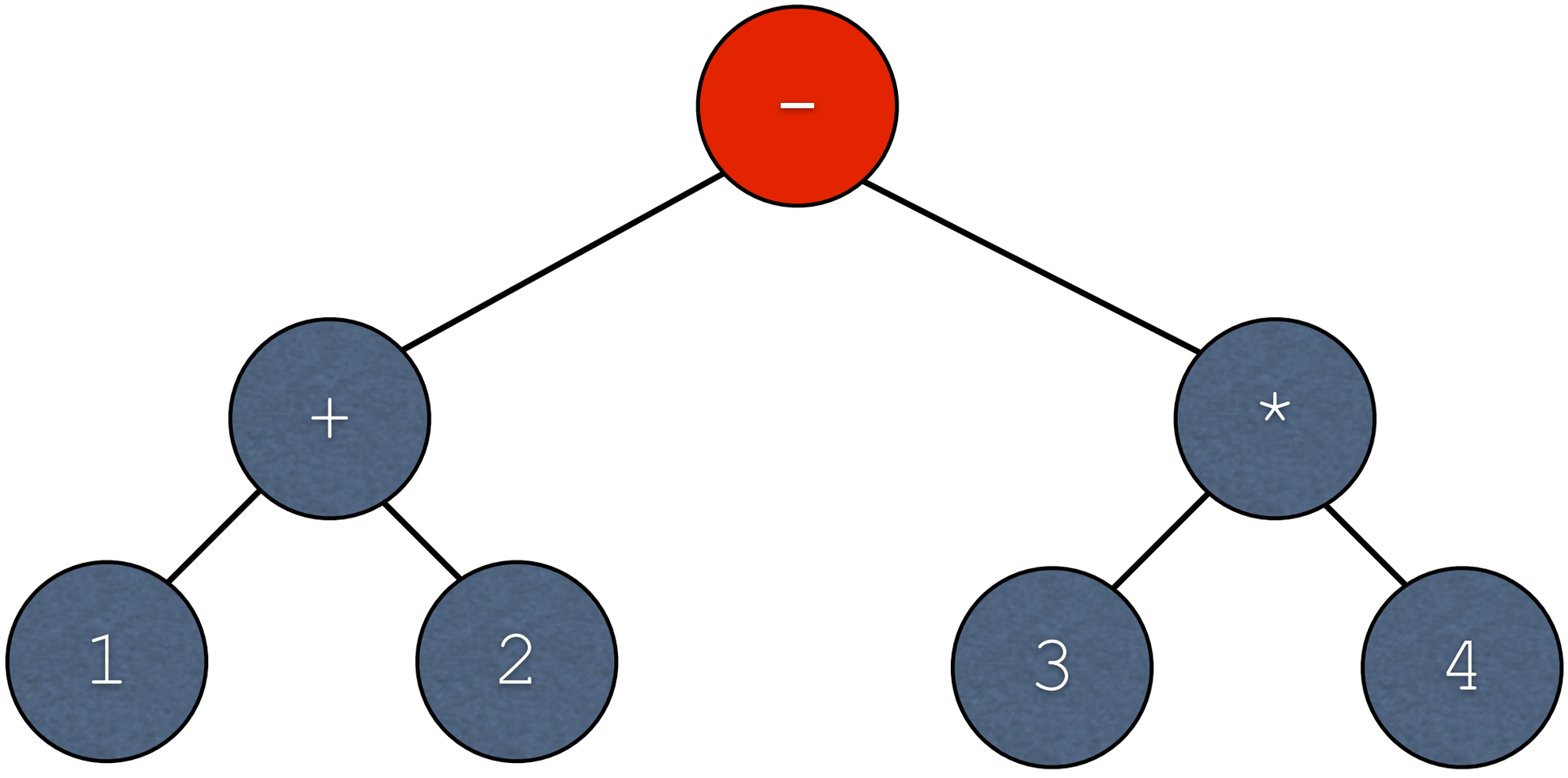

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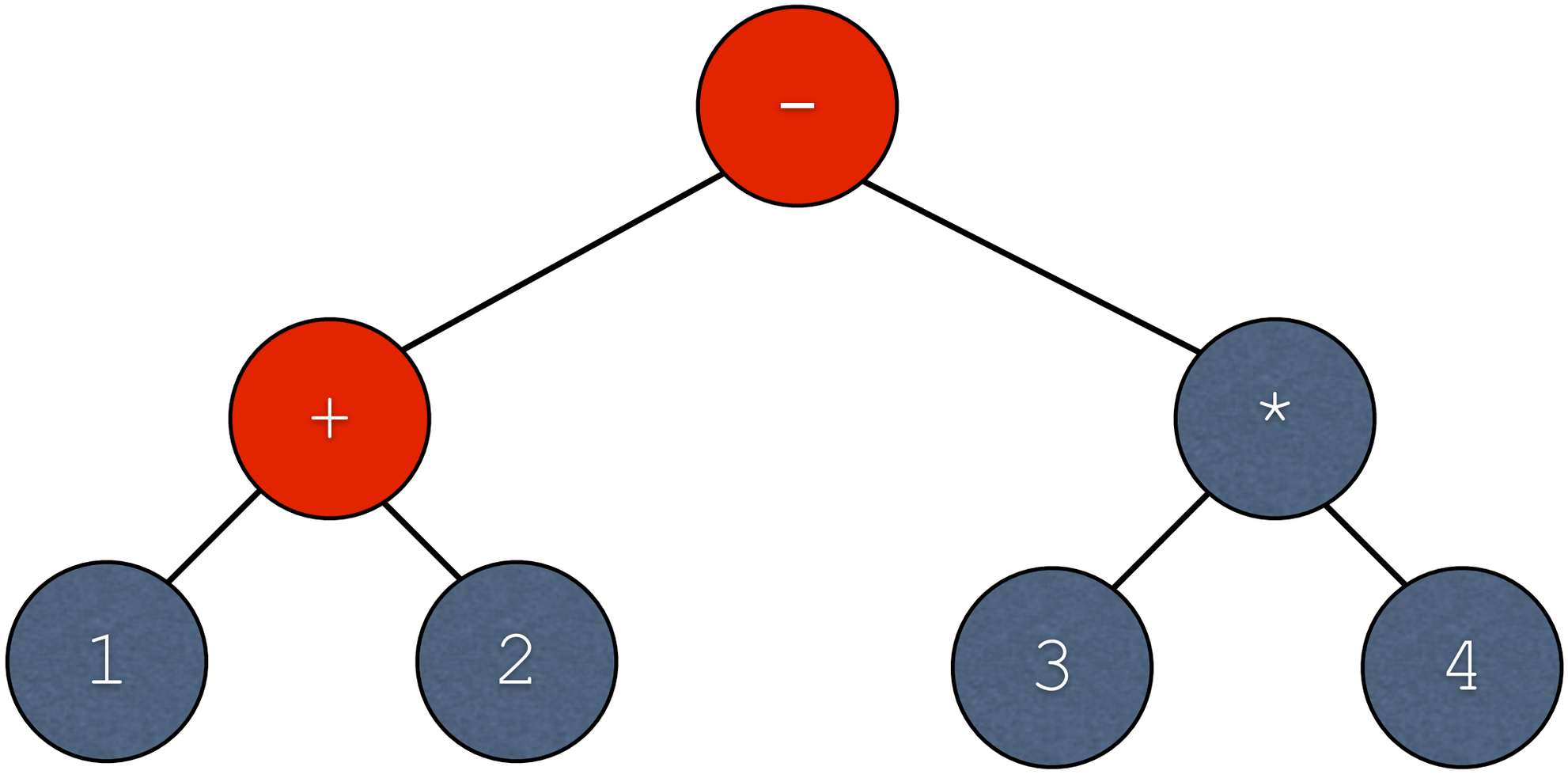

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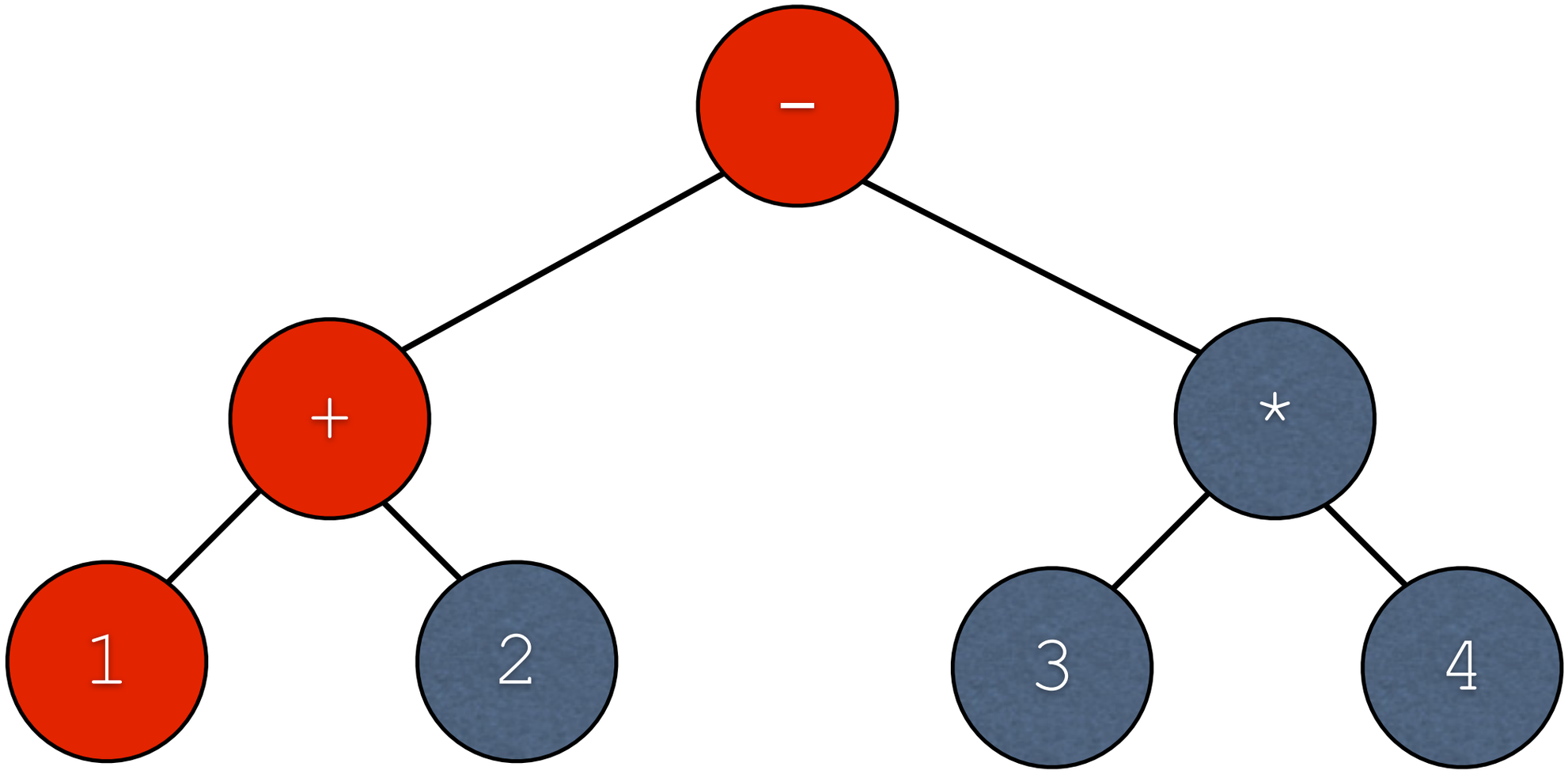

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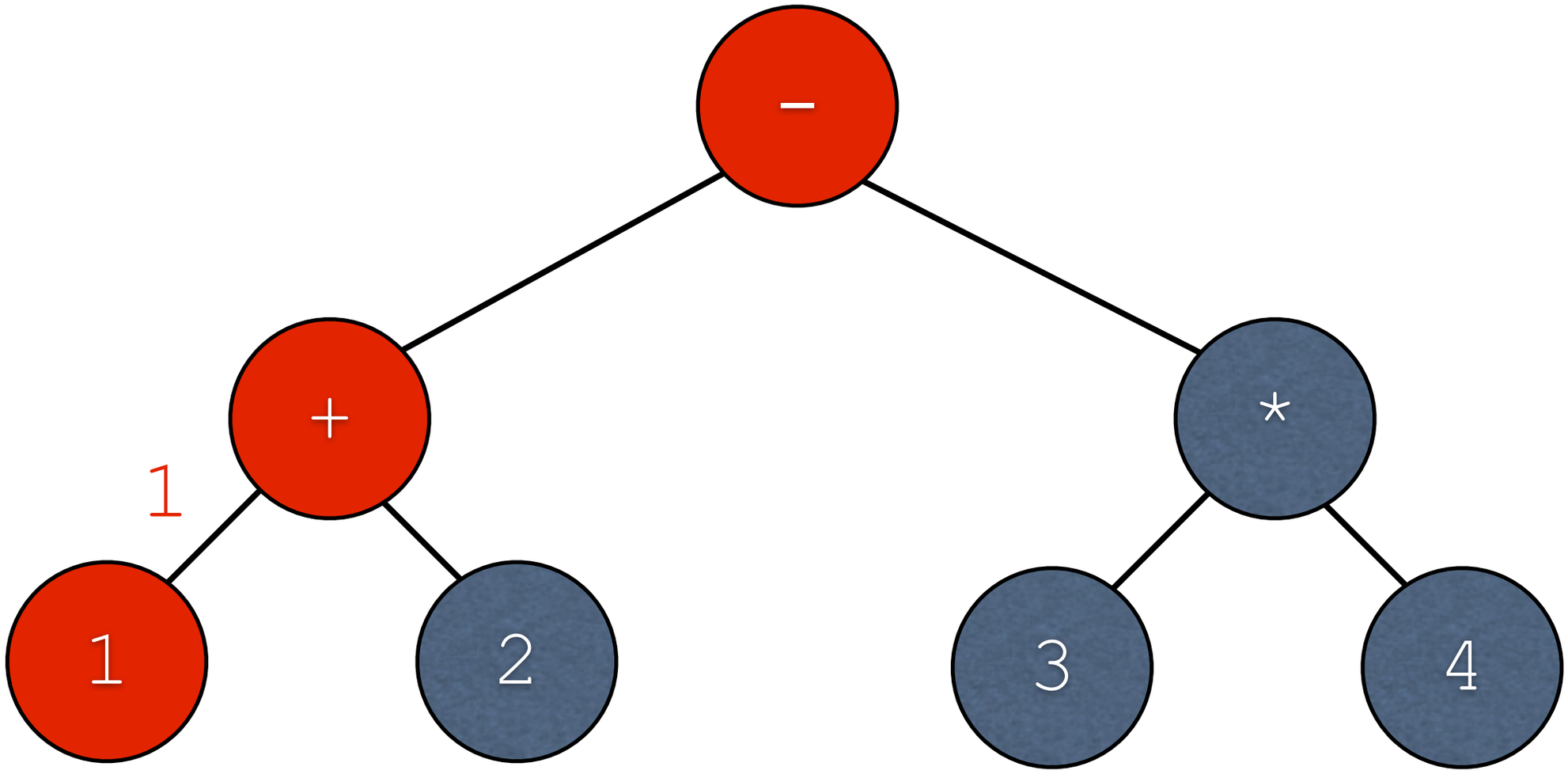

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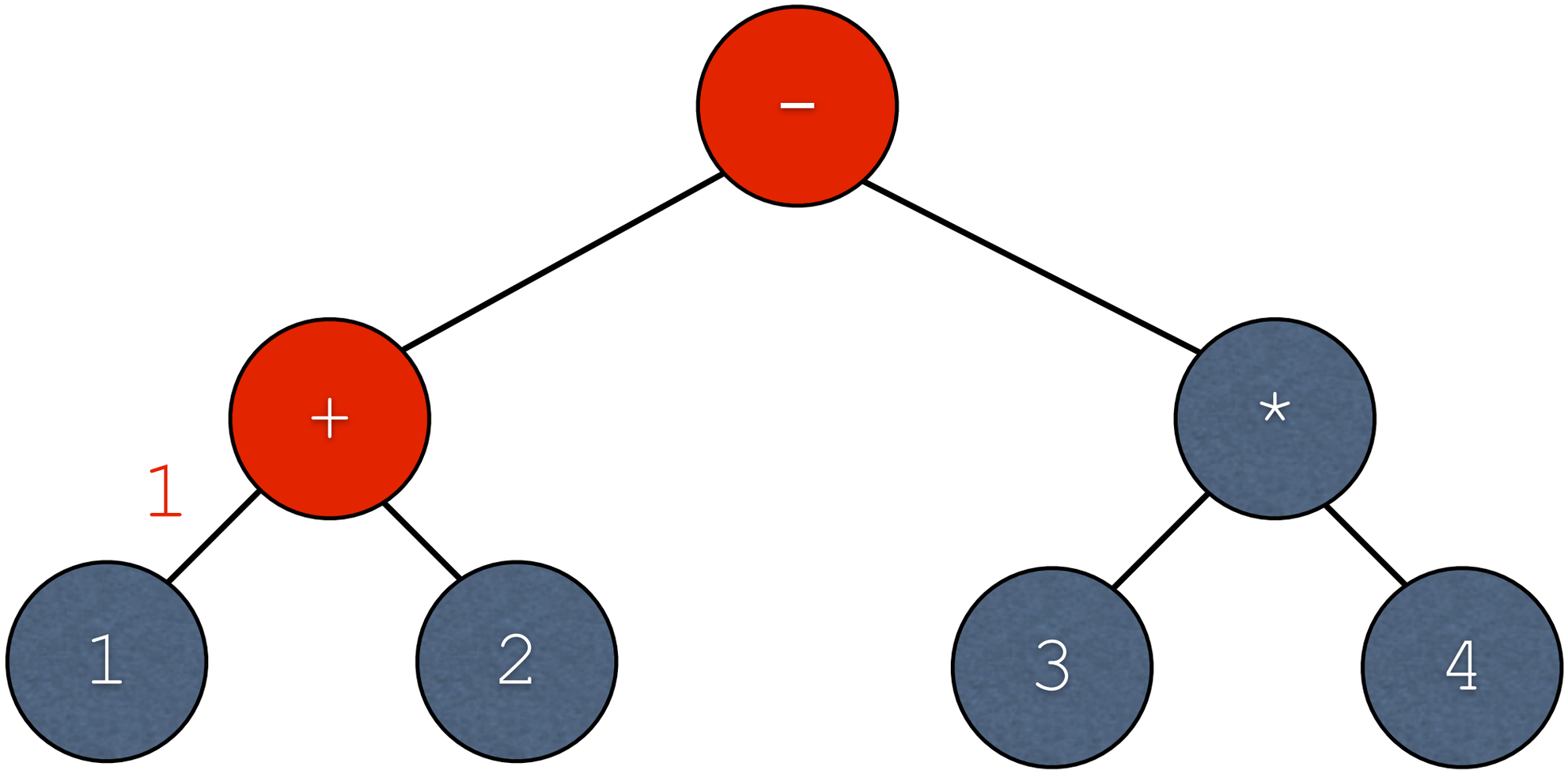

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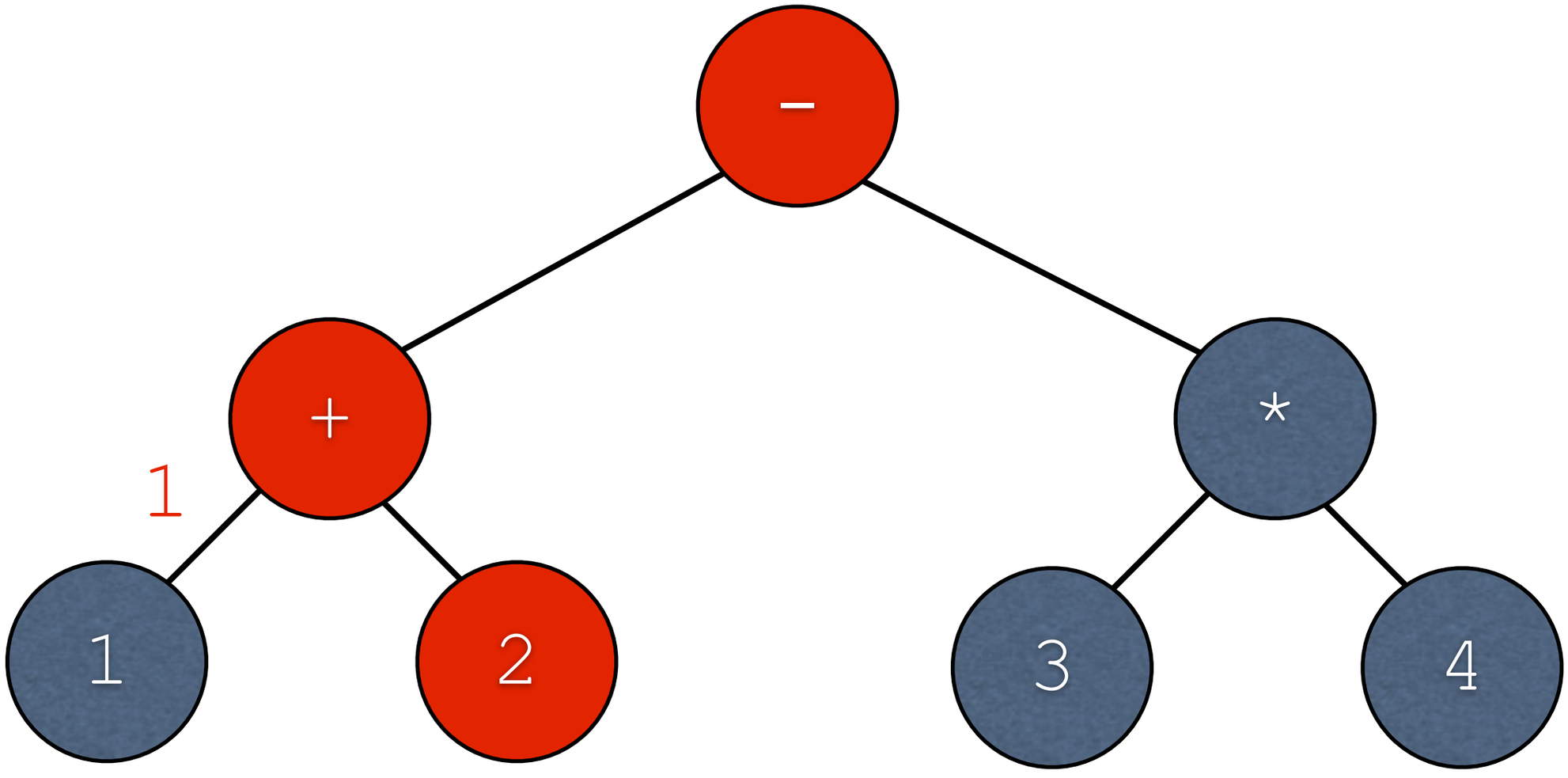

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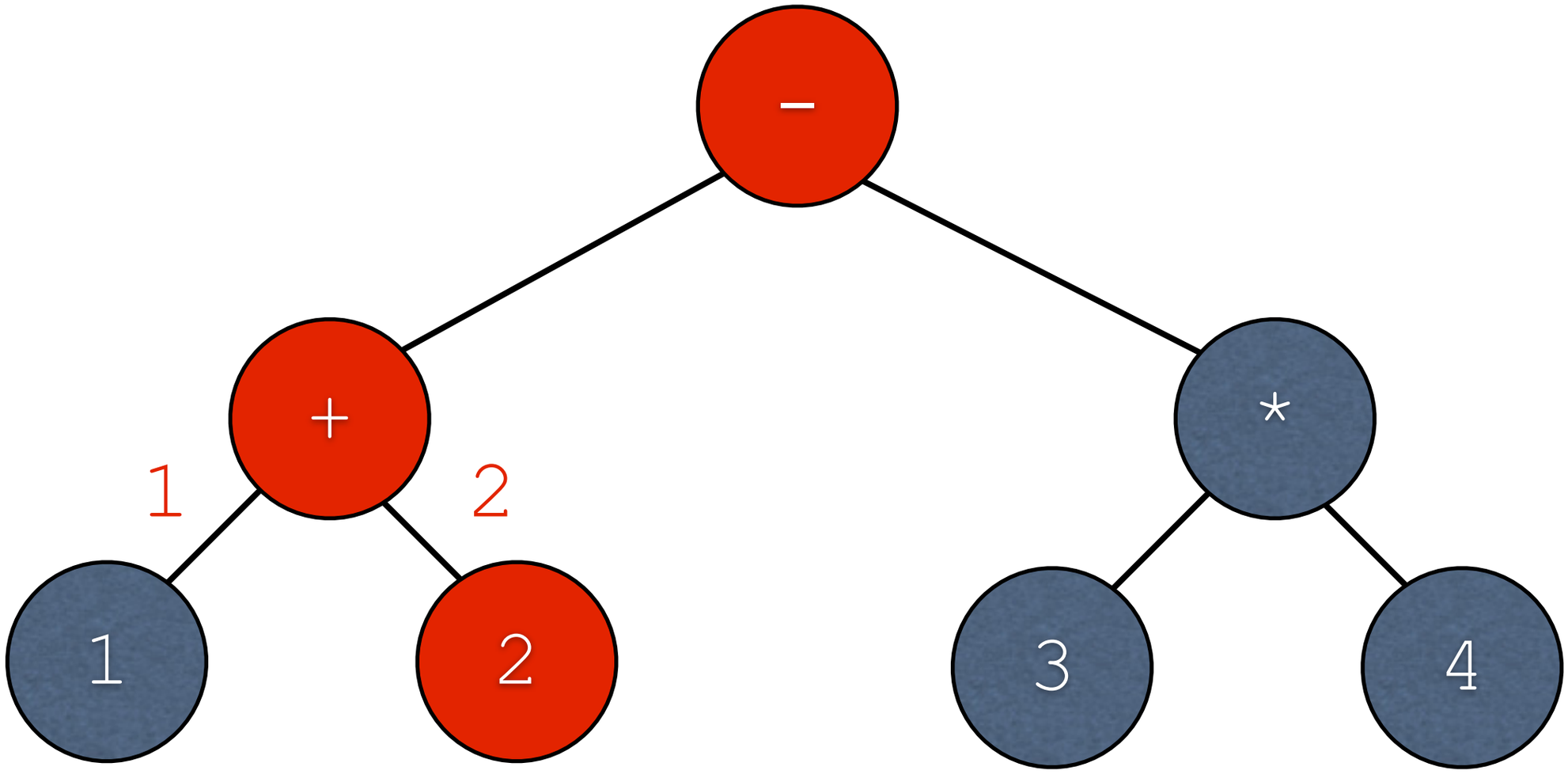

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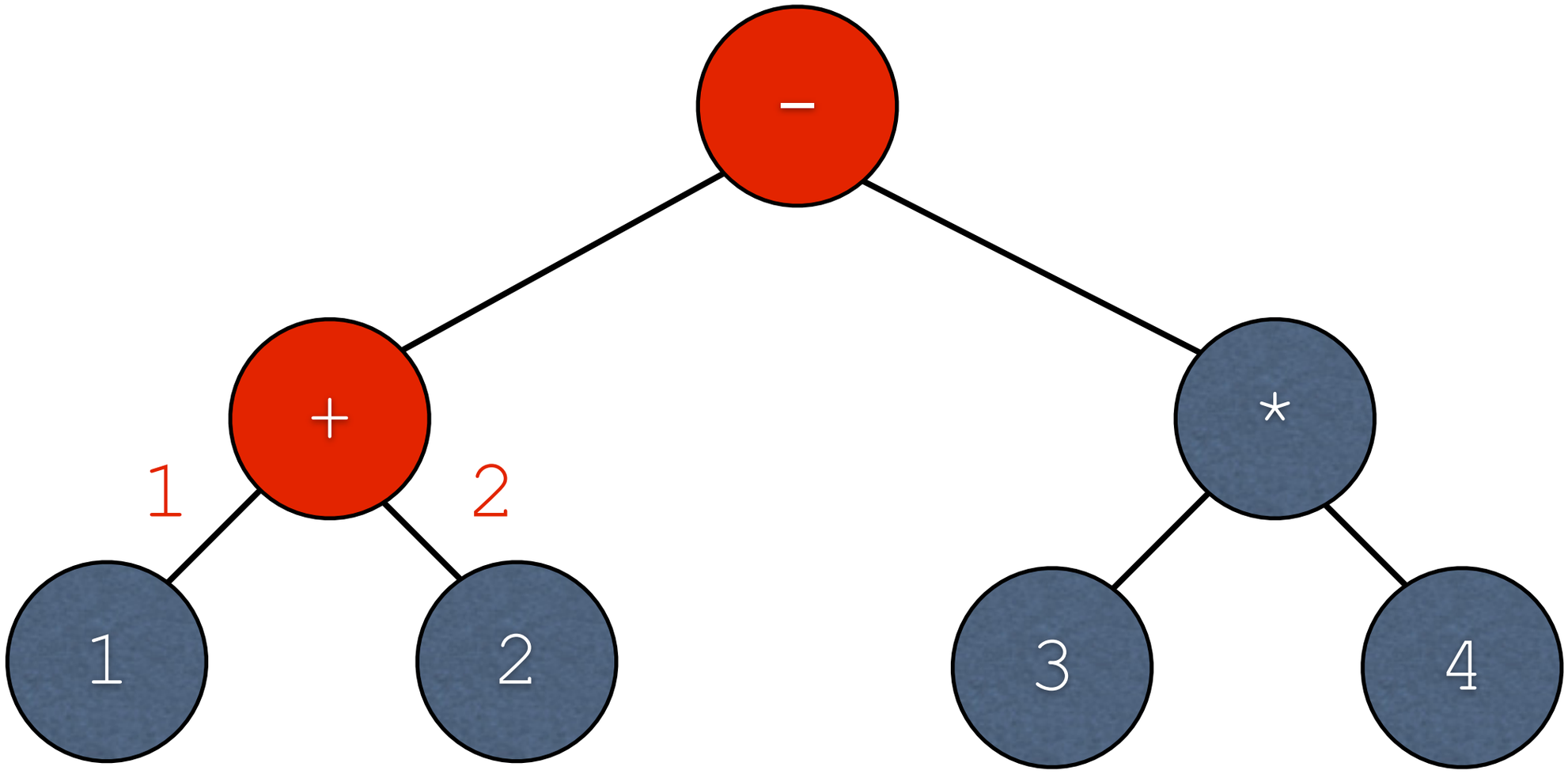

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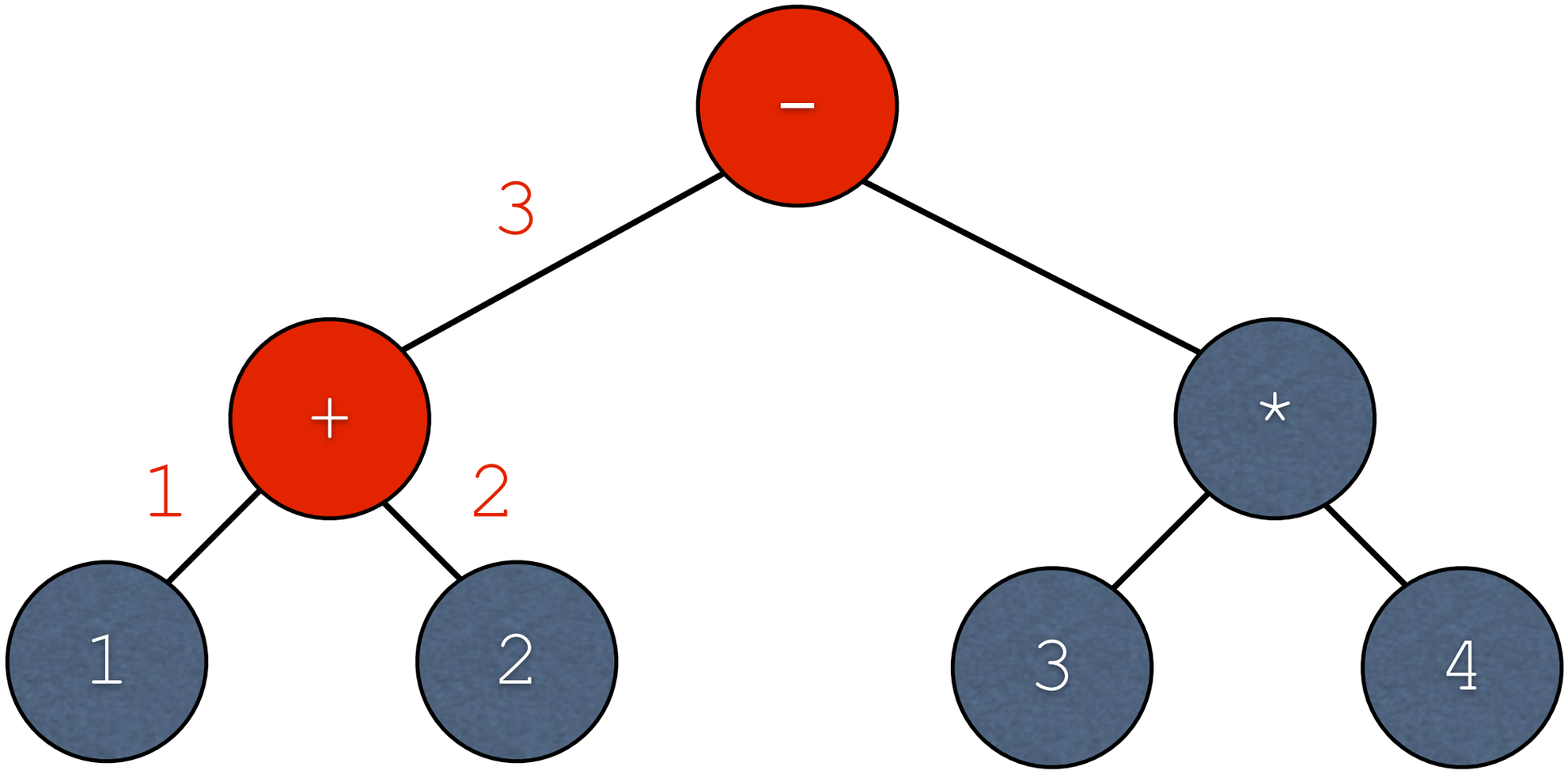

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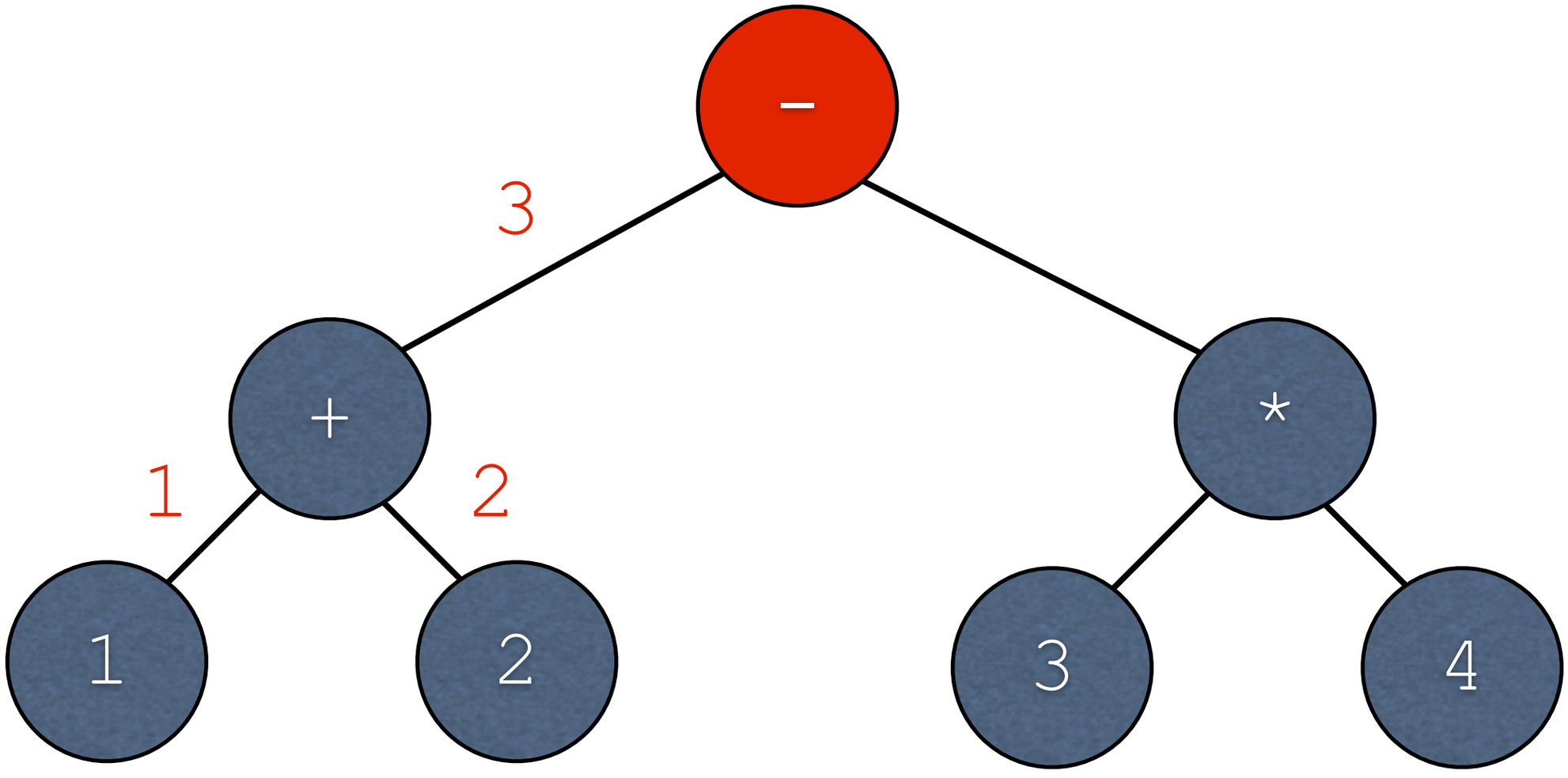

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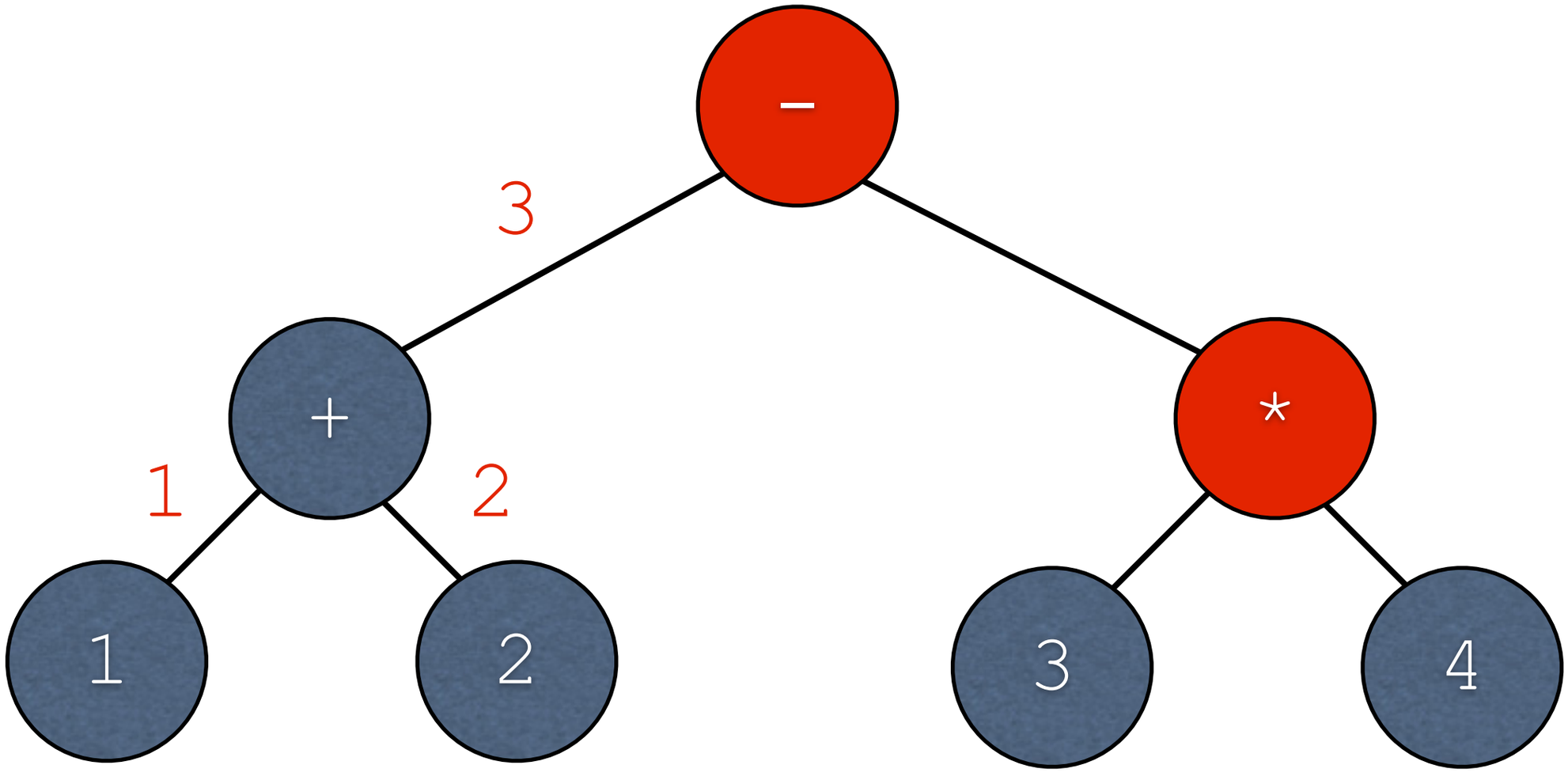

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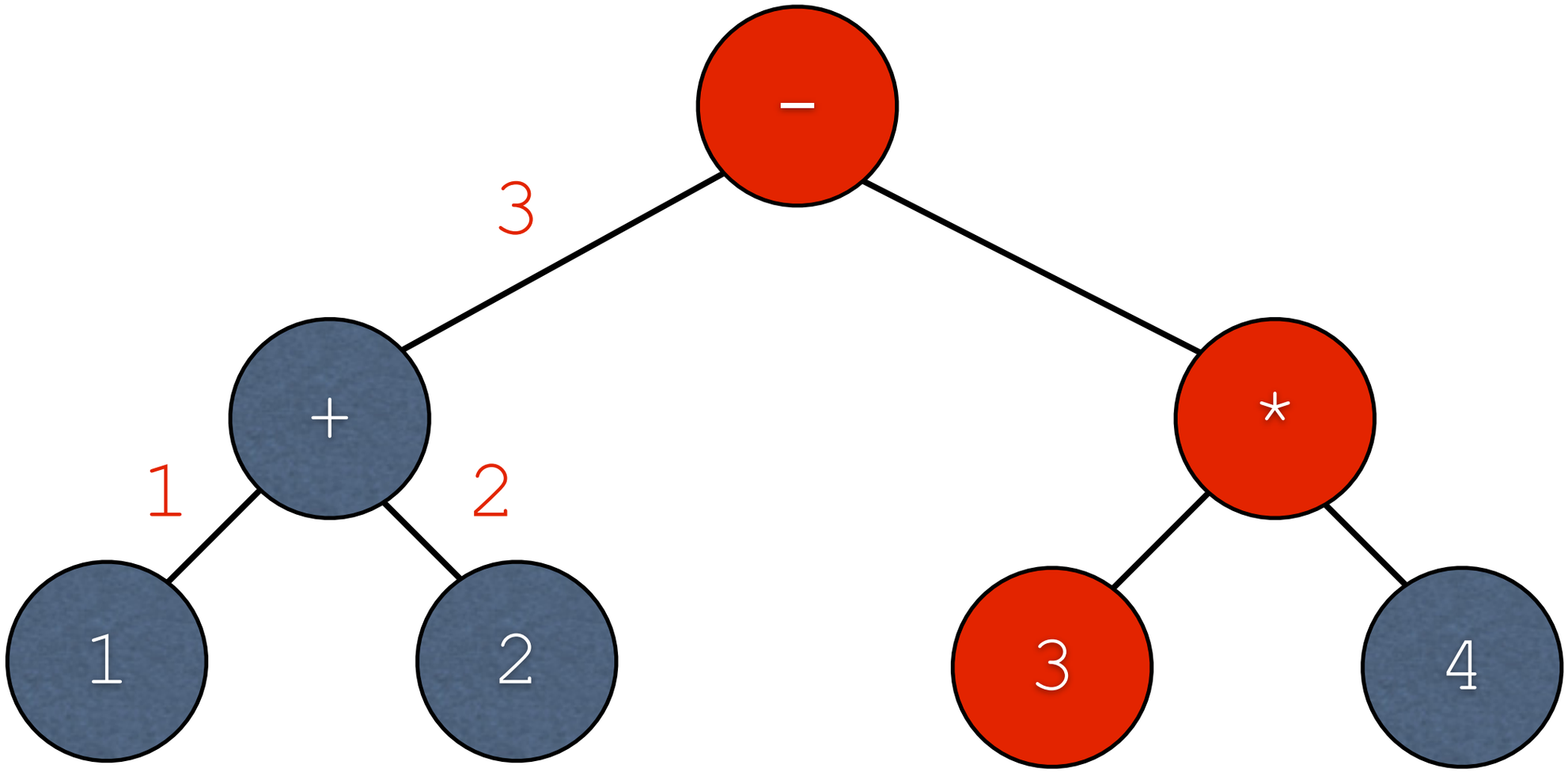

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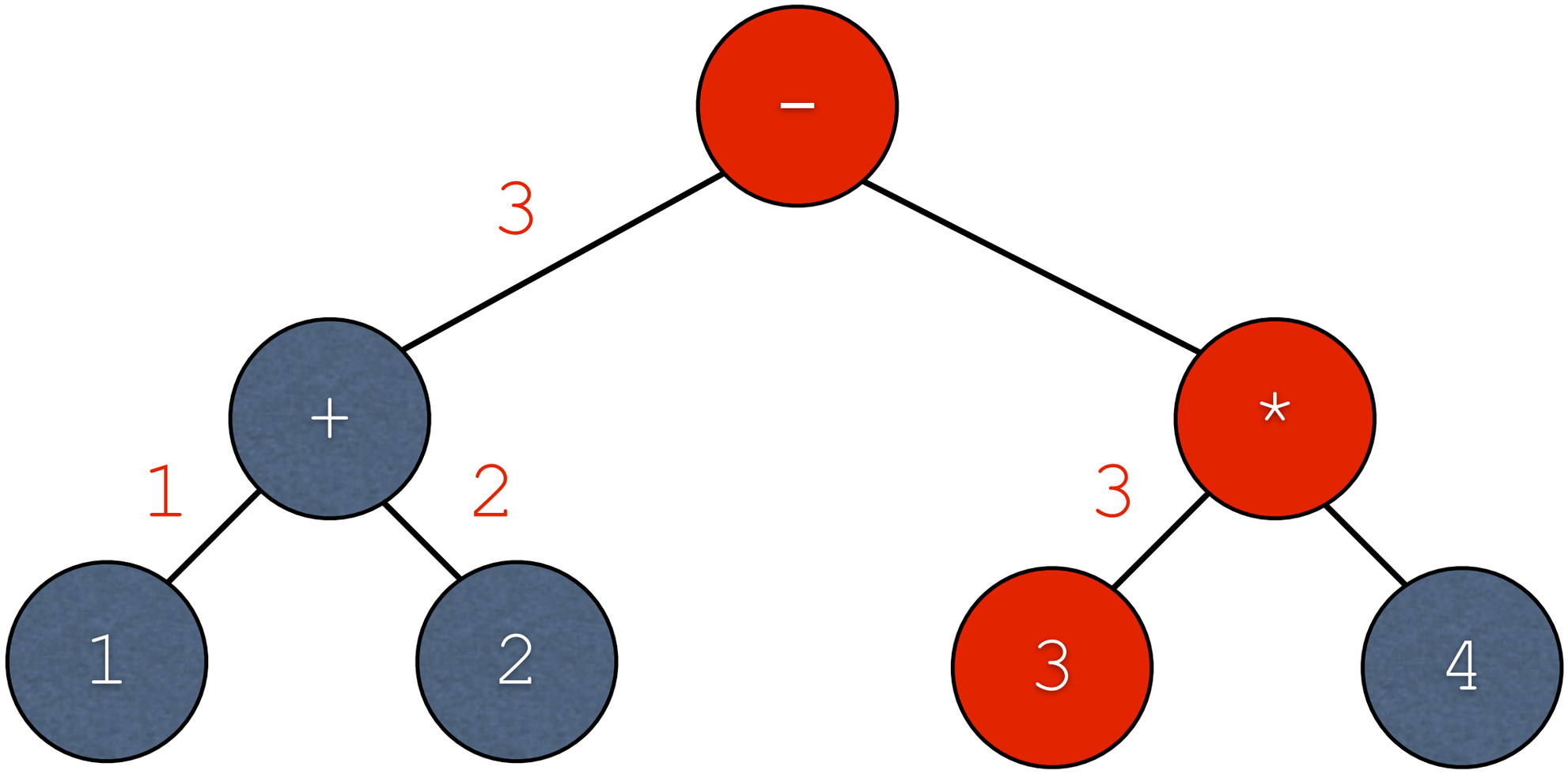

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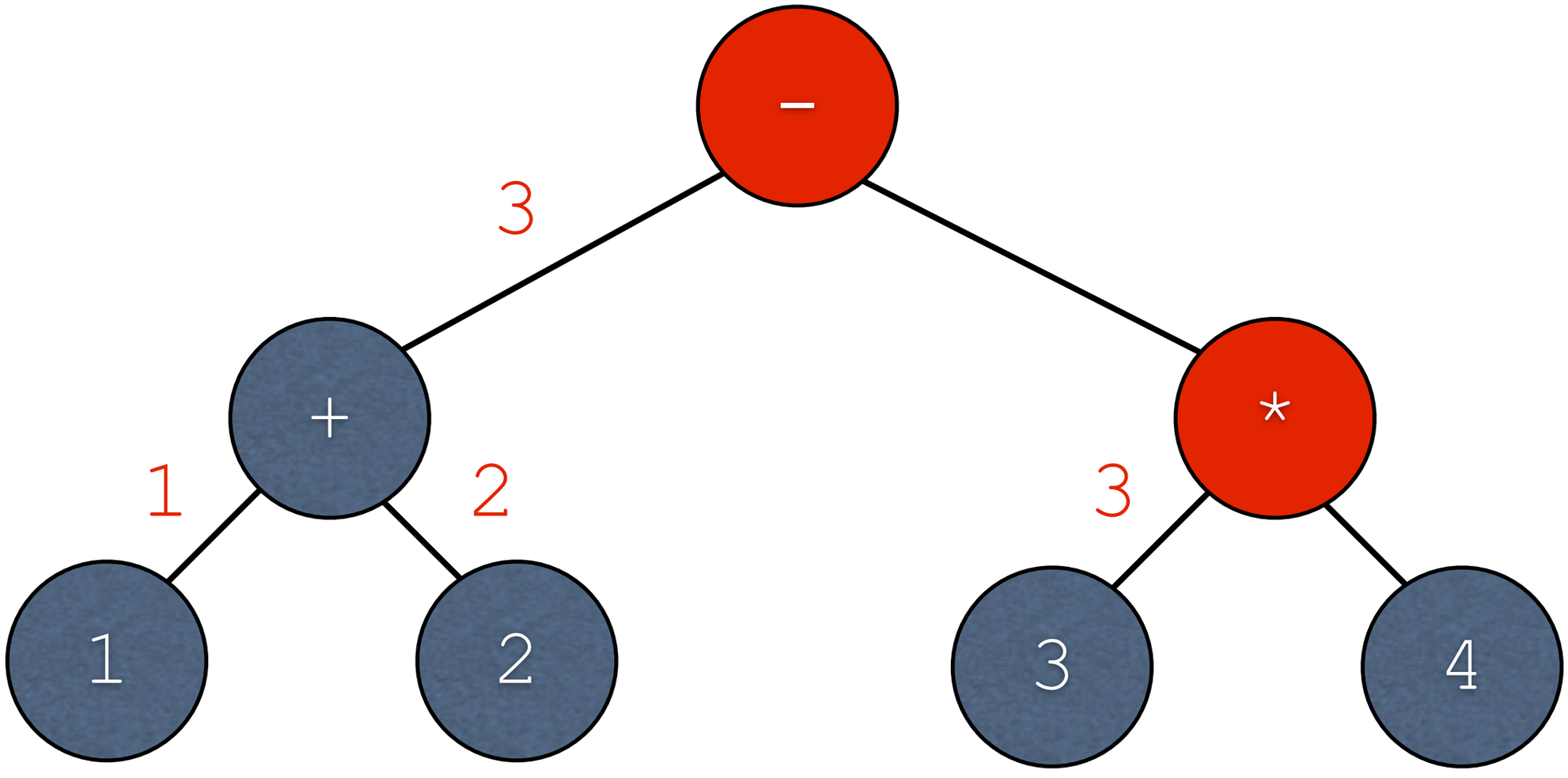

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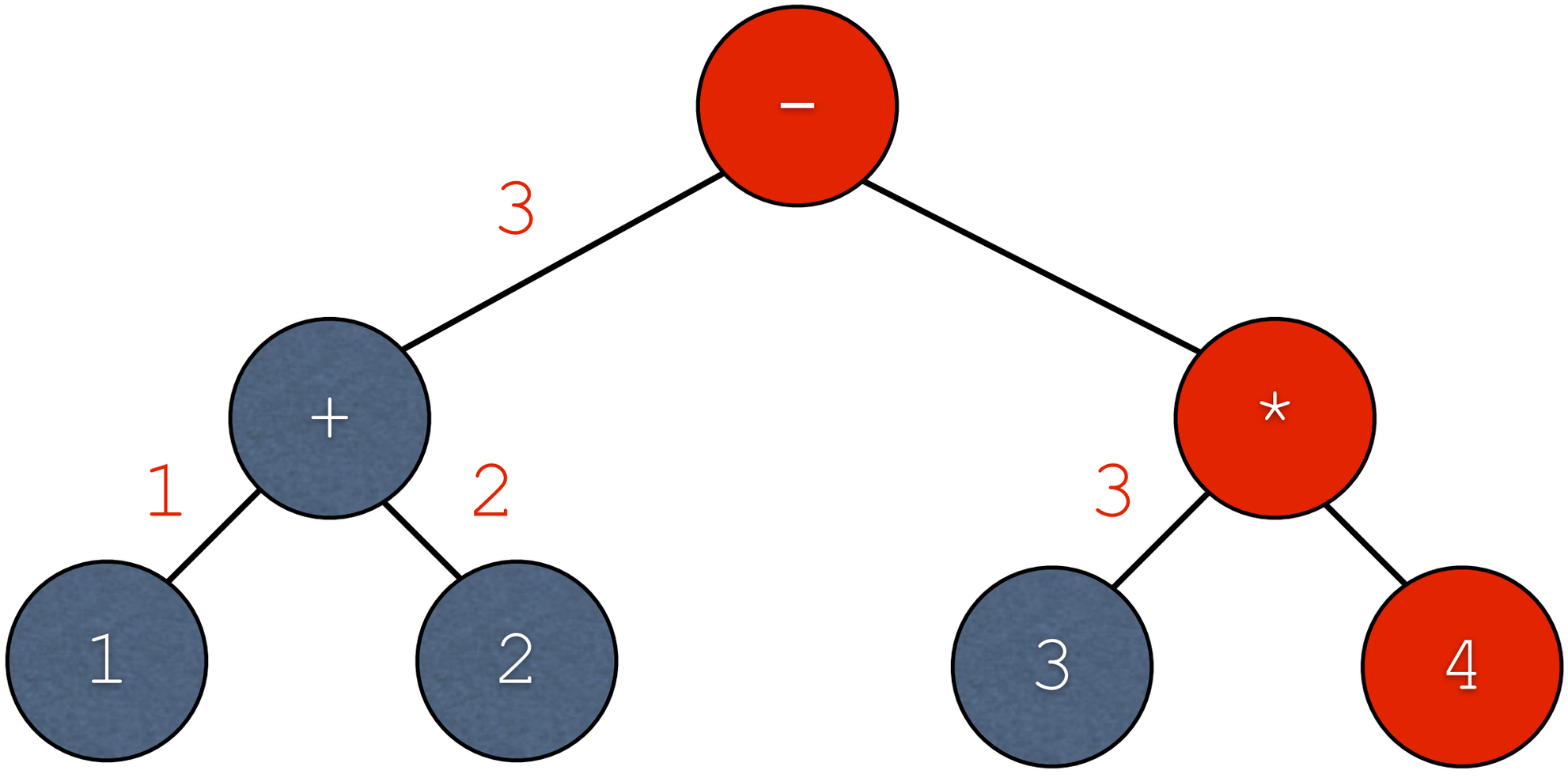

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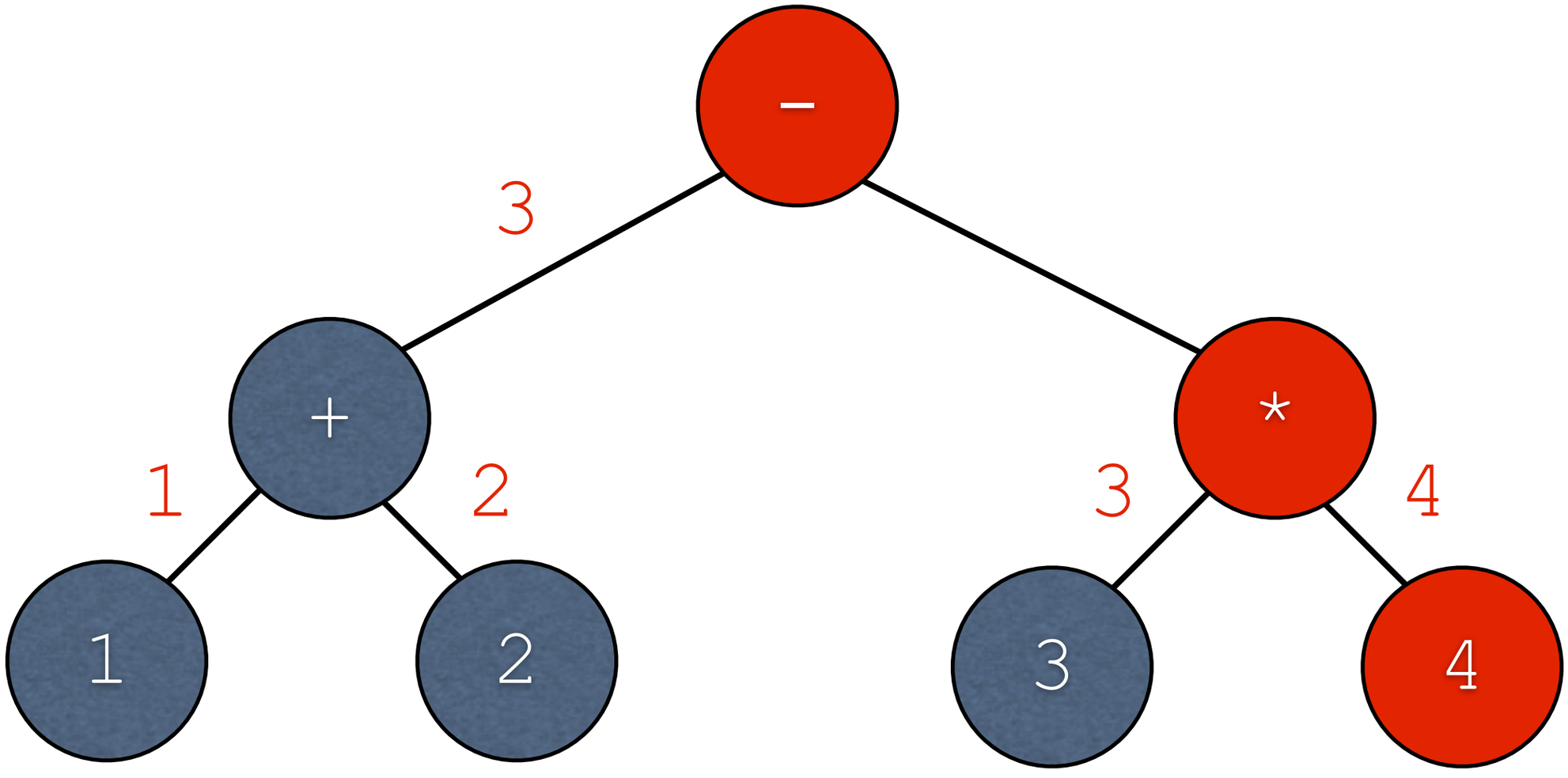

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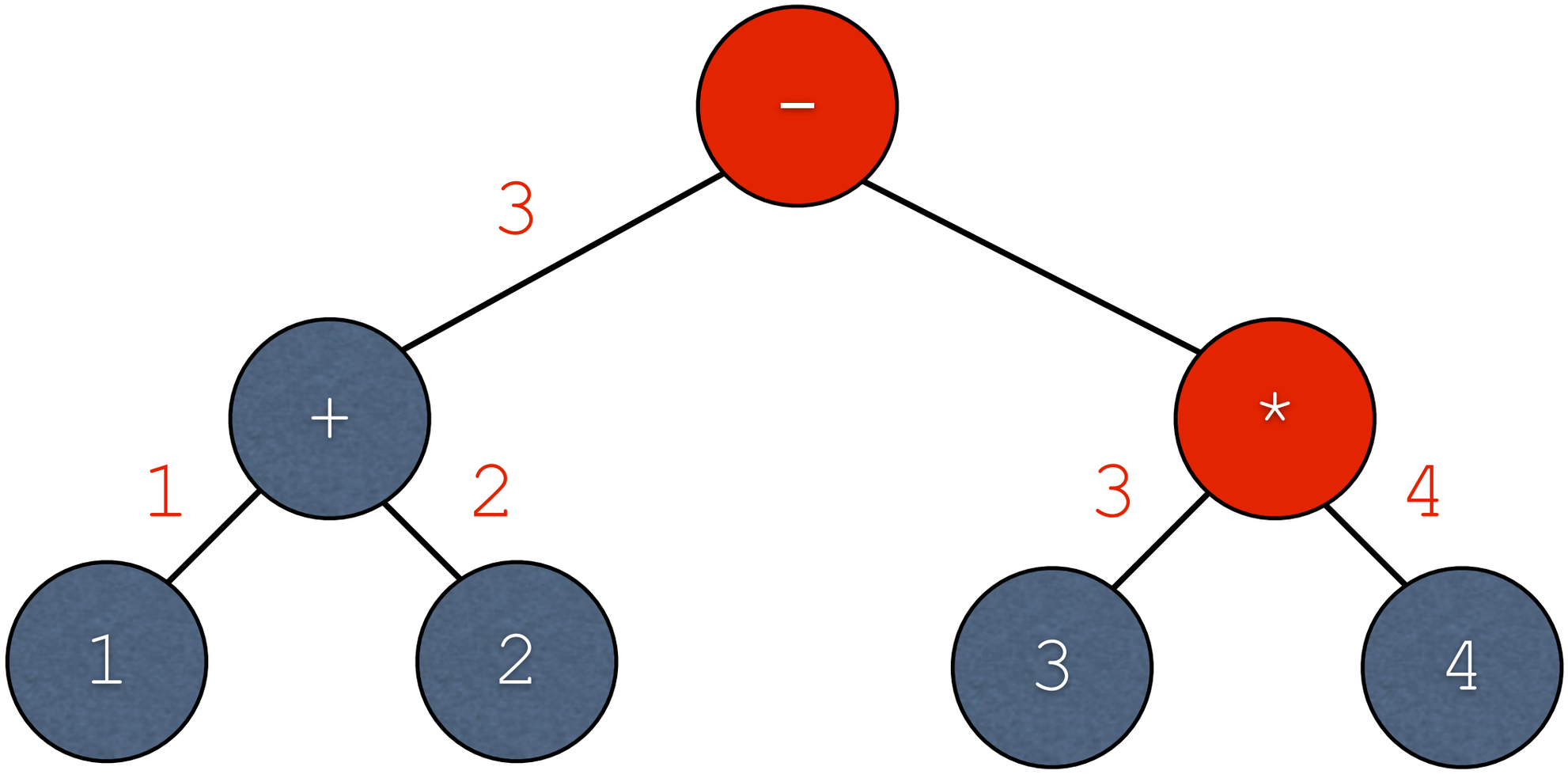

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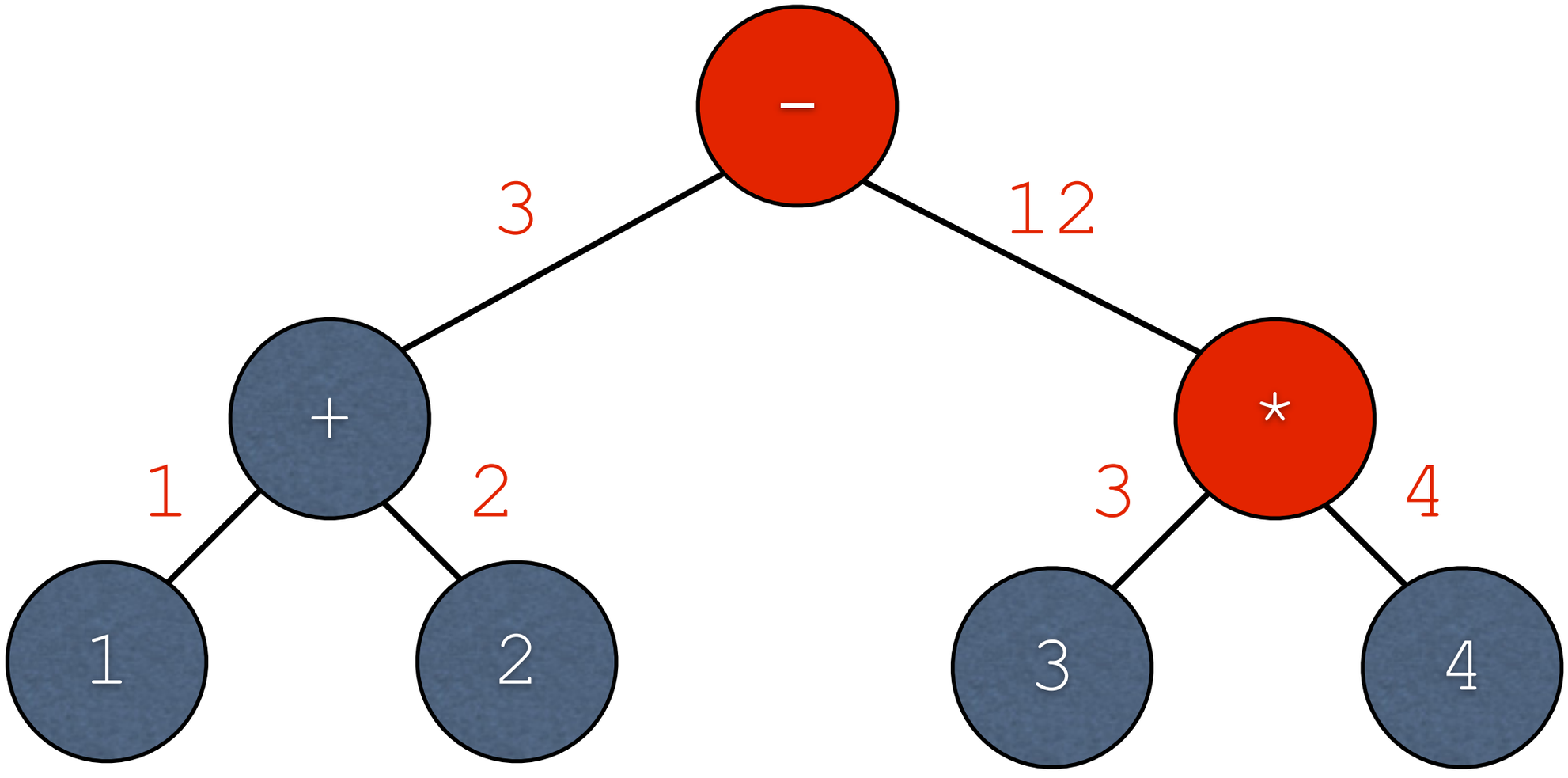

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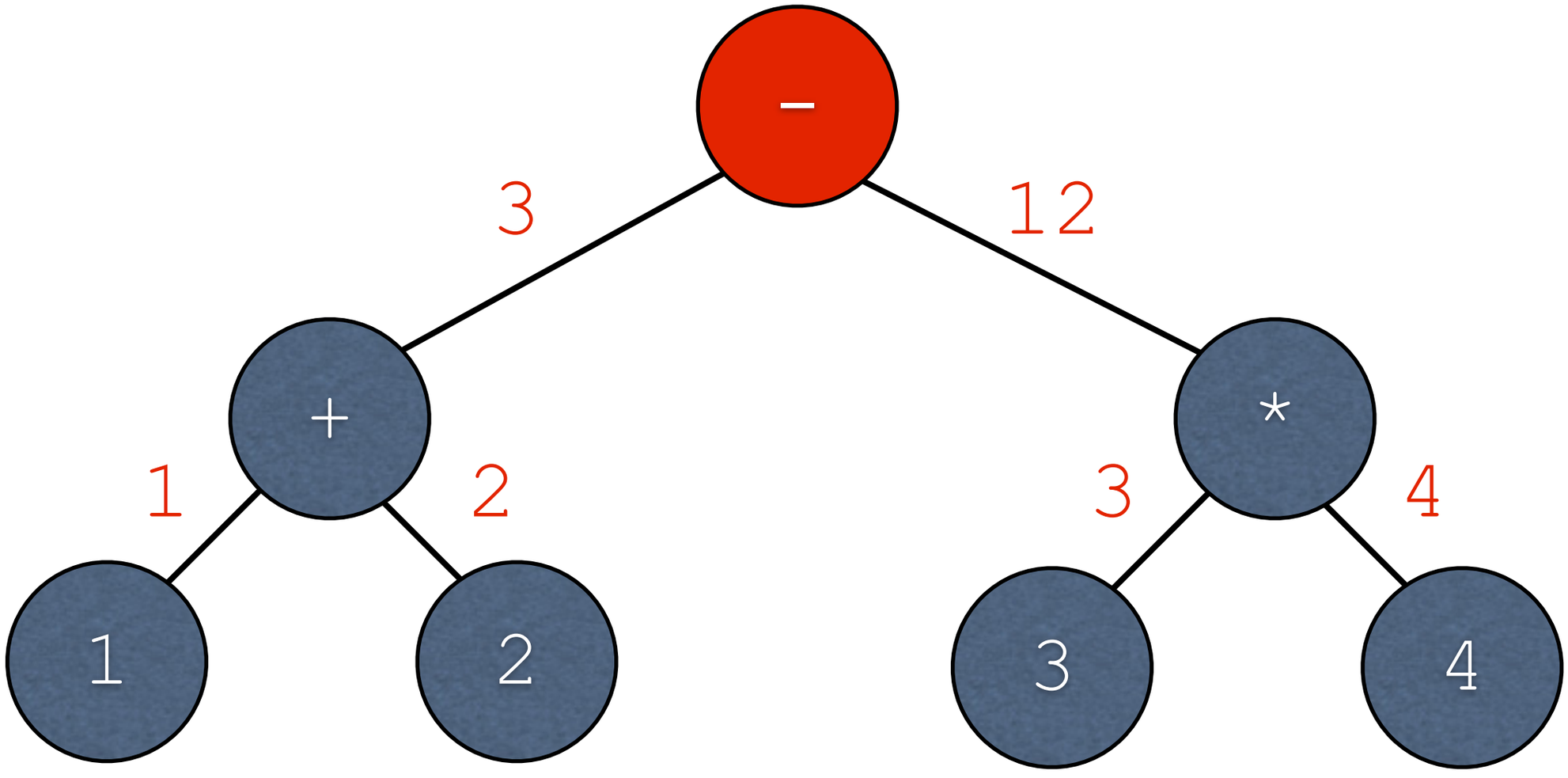

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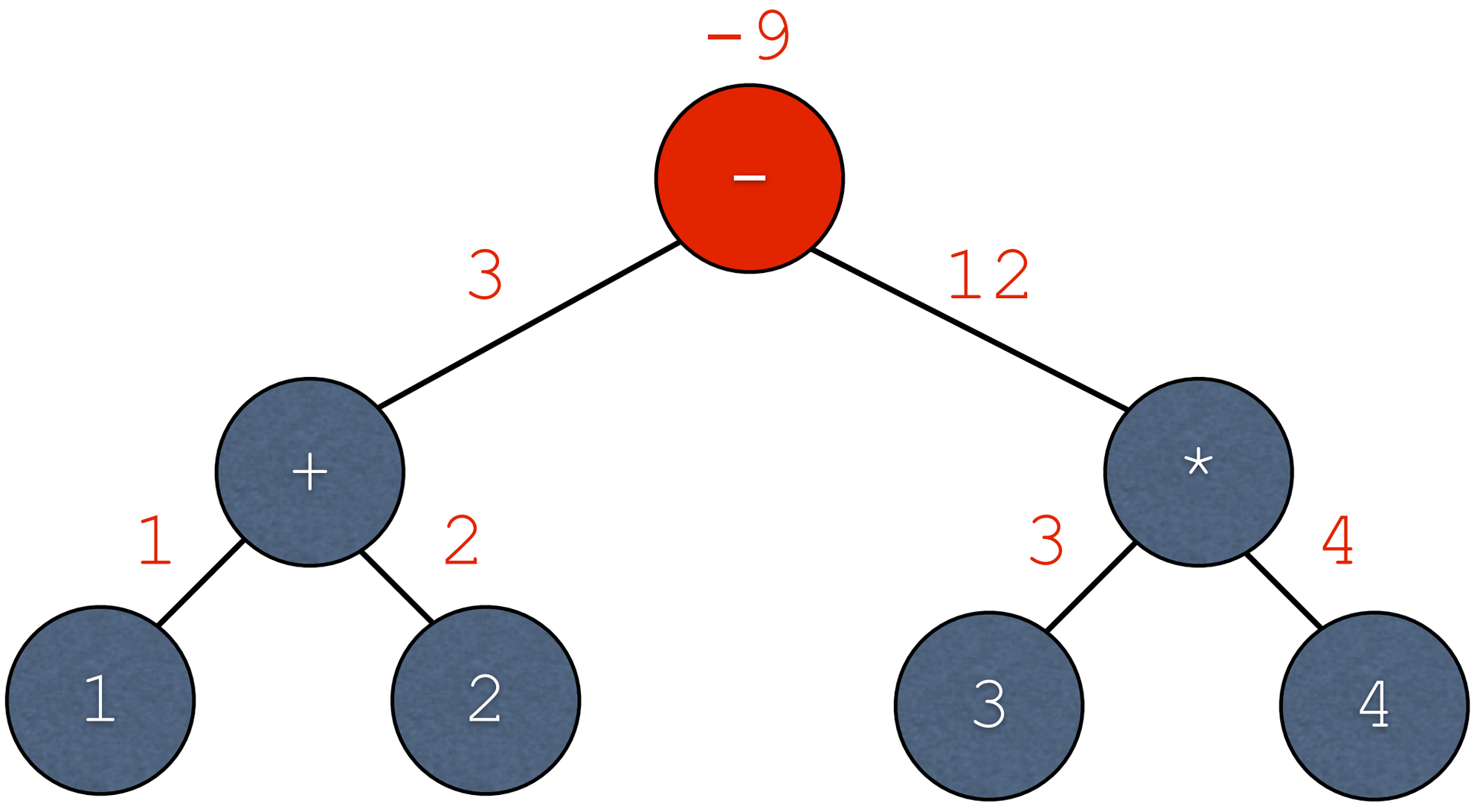

Exercise: Second Side of AST/Evaluation Sheet

Evaluator Example:

arithmetic_evaluator.py