STEVENS
INSTITUTE of TECHNOLOGY
THE INNOVATION UNIVERSITY®

Chain

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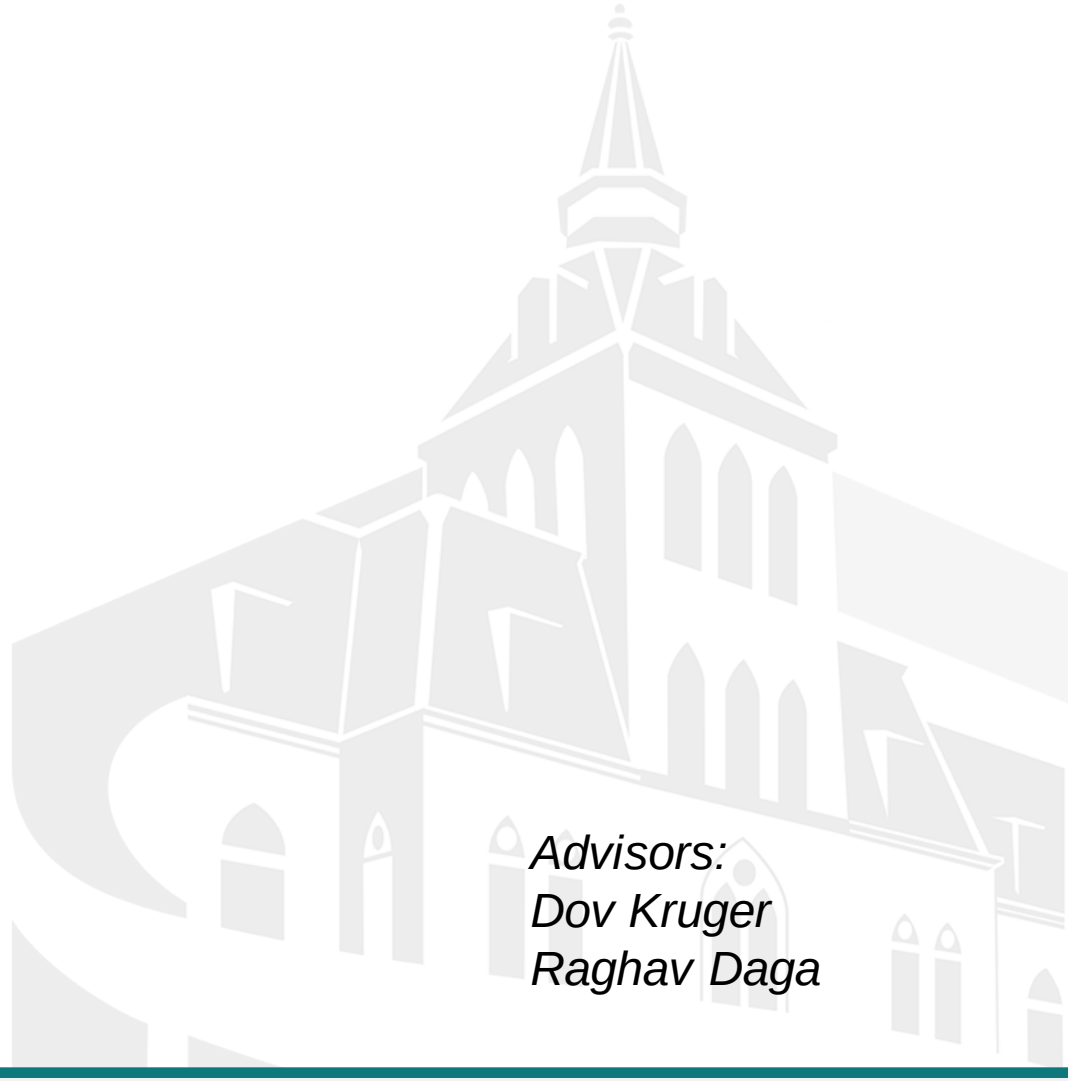

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Problem Statement

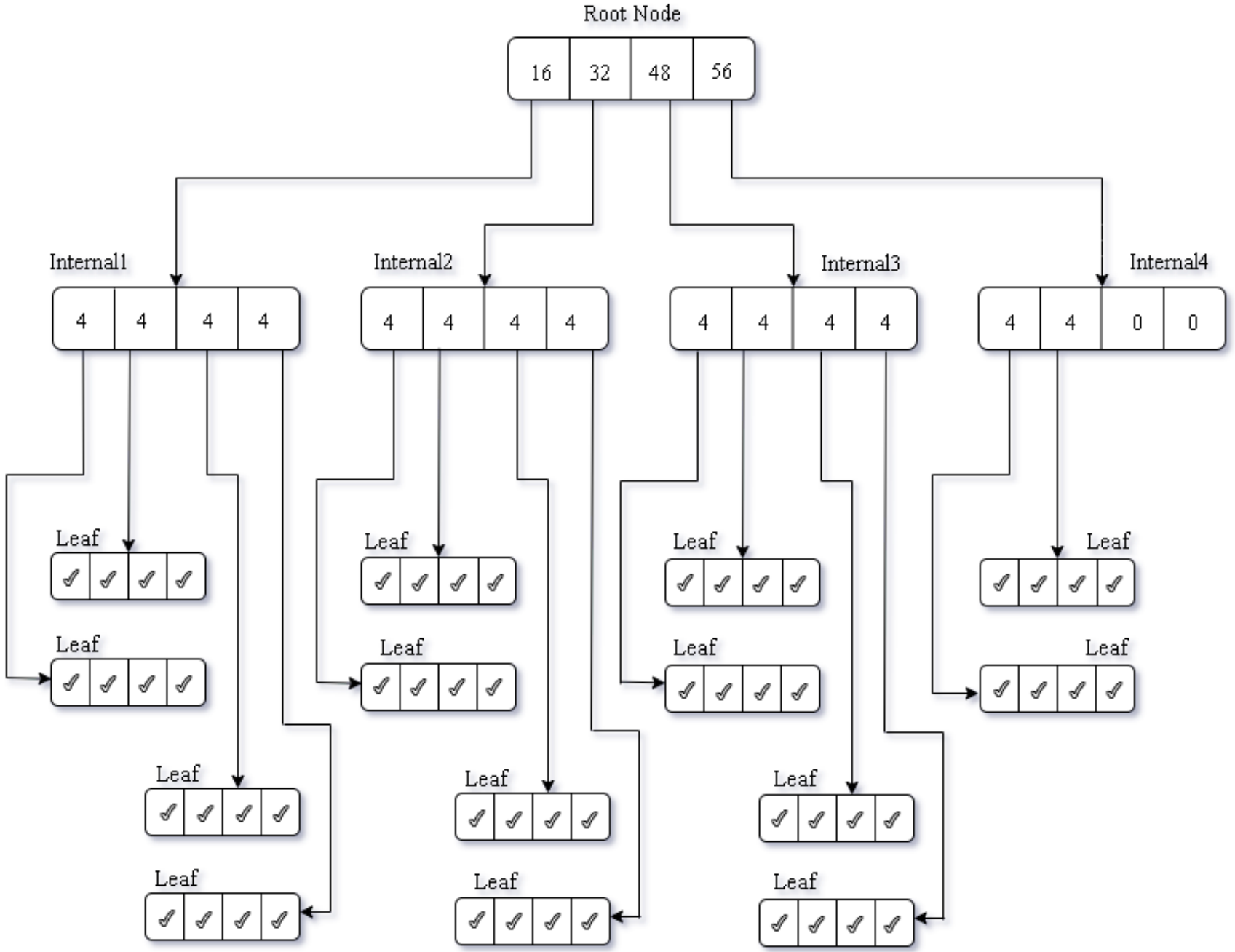
- The String Class:
  - Array based object for streaming char
  - Insertion becomes a problem for large objects
- Chain is an efficient tree structure for reading extremely large files.

Literature

- Ropes

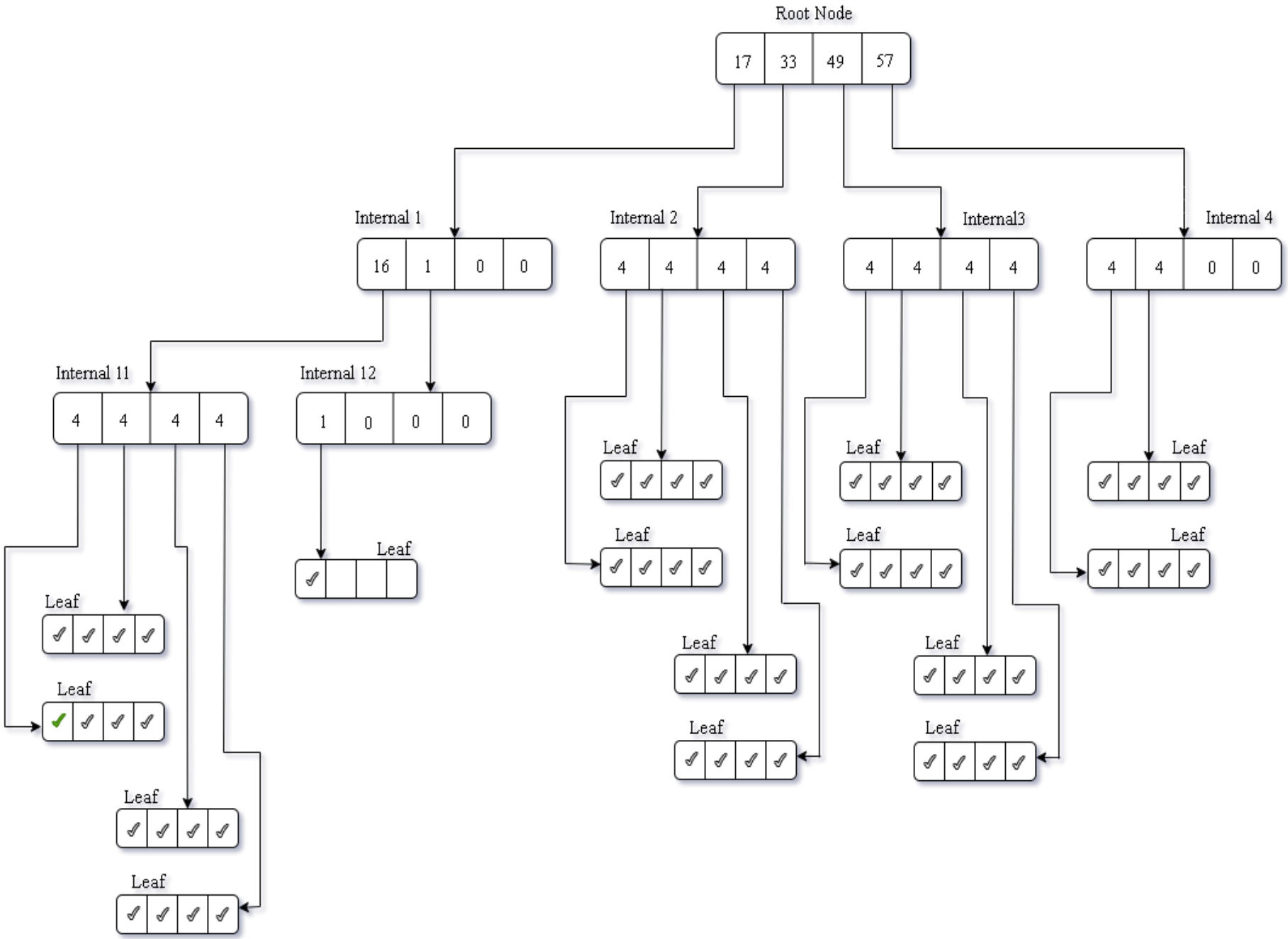
Structure

- M-ary Trees.
- Rules:
  at most m children
  Special cases:
  binary , ternary tree
- Root Node-
  Pointer to internal nodes
  counter for #lines
- Internal Nodes-
  Pointer to internal/leaf
  counter for #lines
- Leaf Nodes
  Pointer to String
  (which is a line)



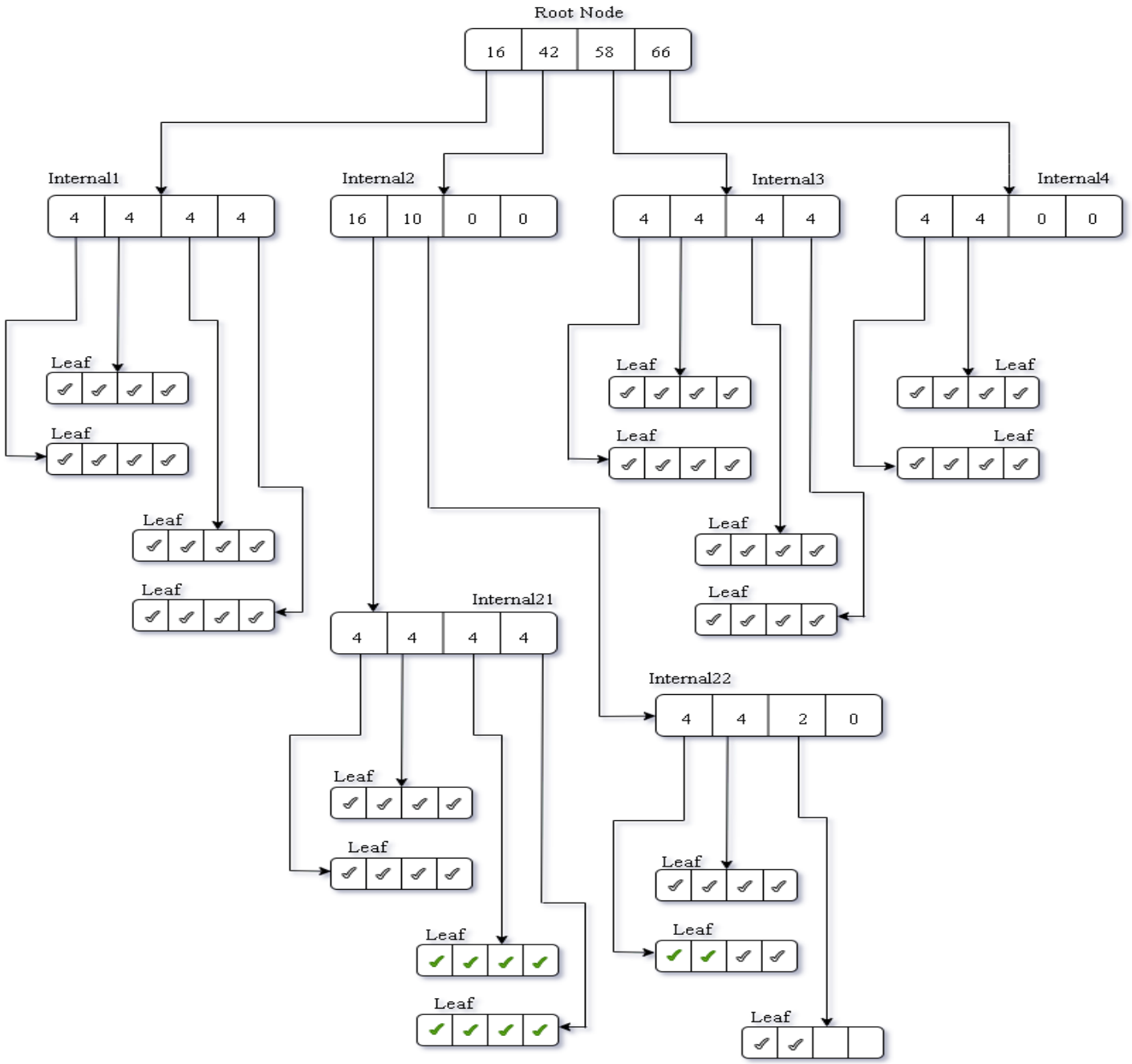
Insert start

- Check space in Internal1
- Split Internal1
- Insert at pos1
- Shift everything to right



Insert middle

- Insert 10 lines at pos 25



Base Struct: refer.

- M-ary Trees.
- Rules:
  at most m children
  Special cases:
  binary , ternary tree
- Root Node-
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  counter for #lines
- Internal Nodes-
  Pointer to internal/leaf
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- Leaf Nodes
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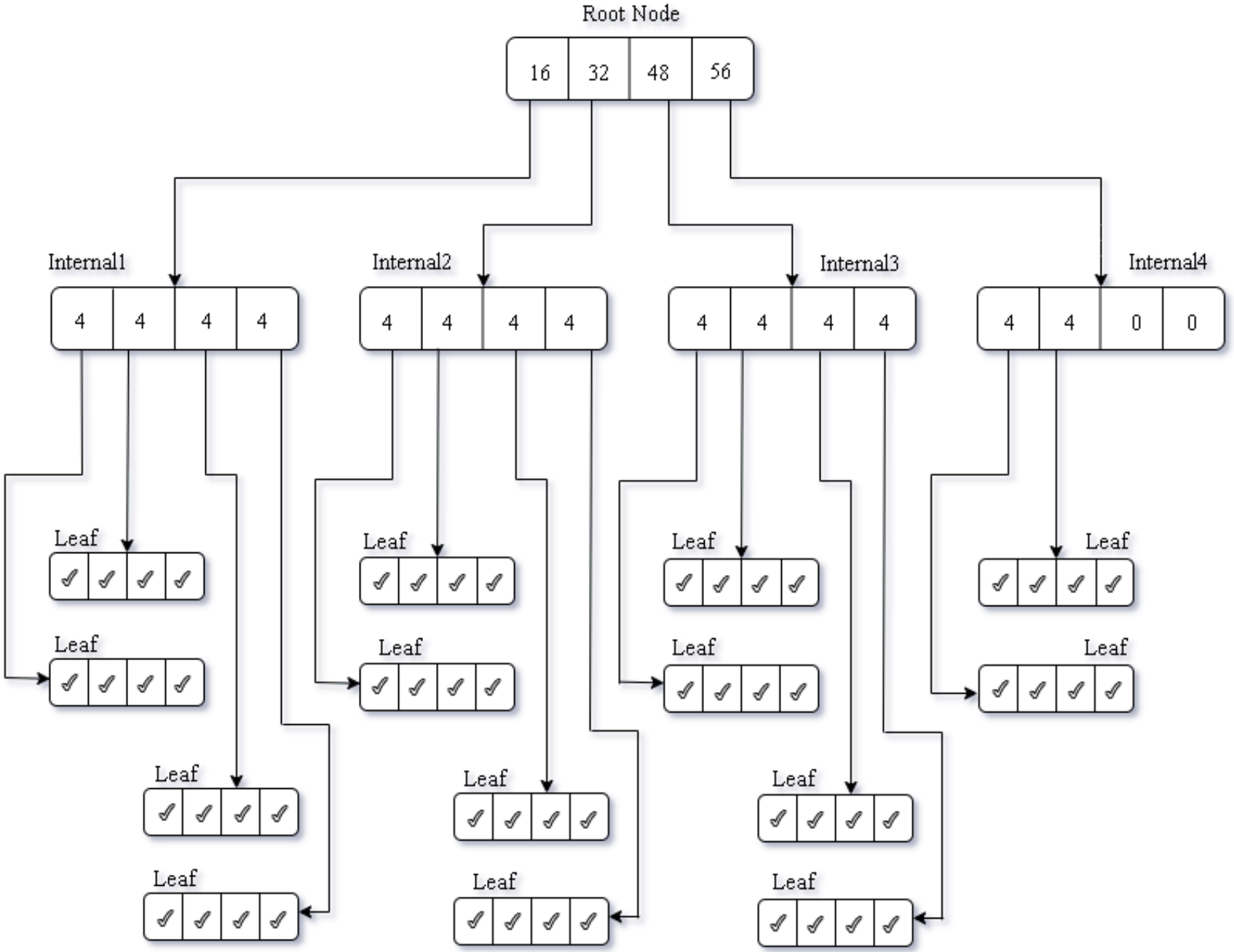
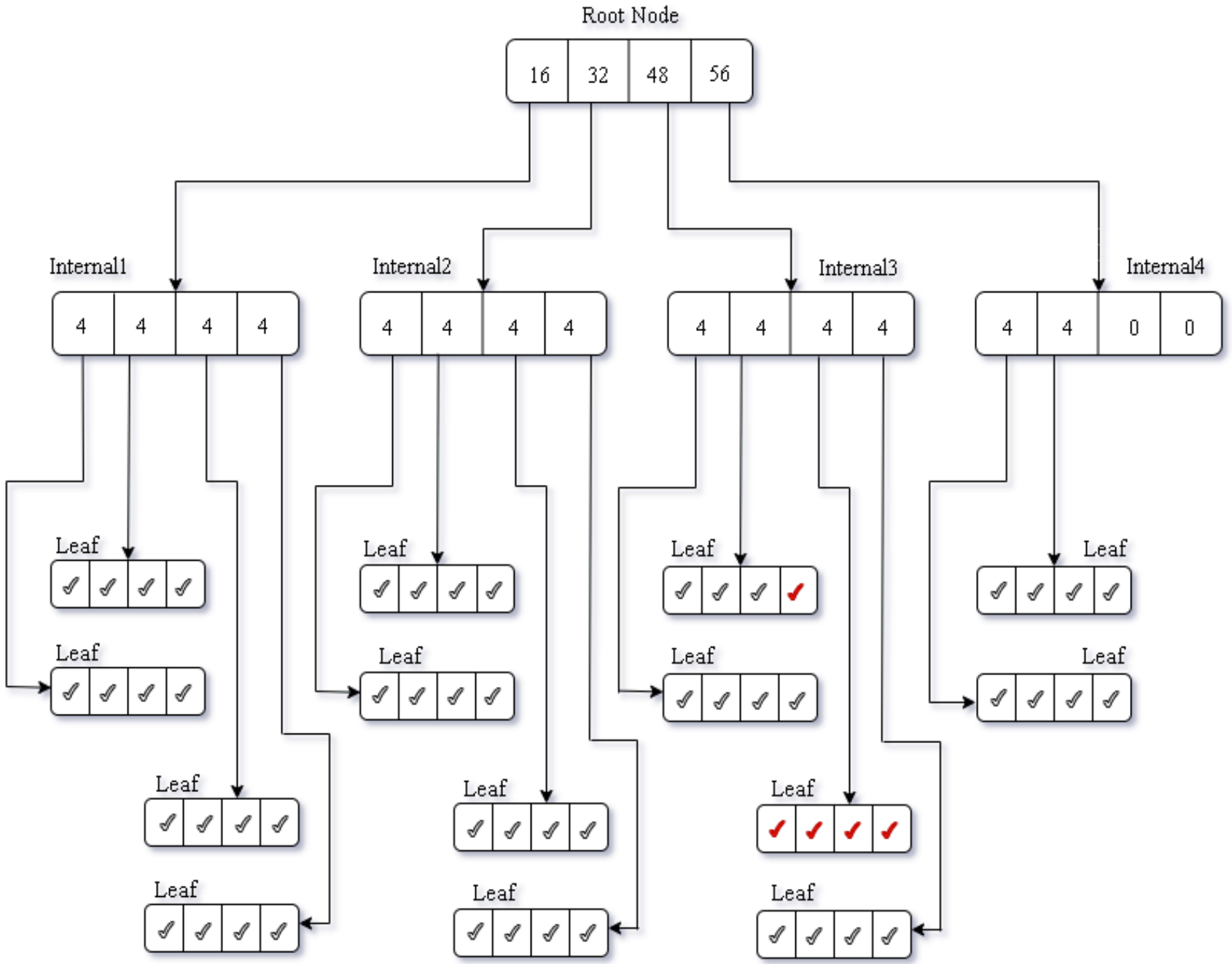
  (which is a line)

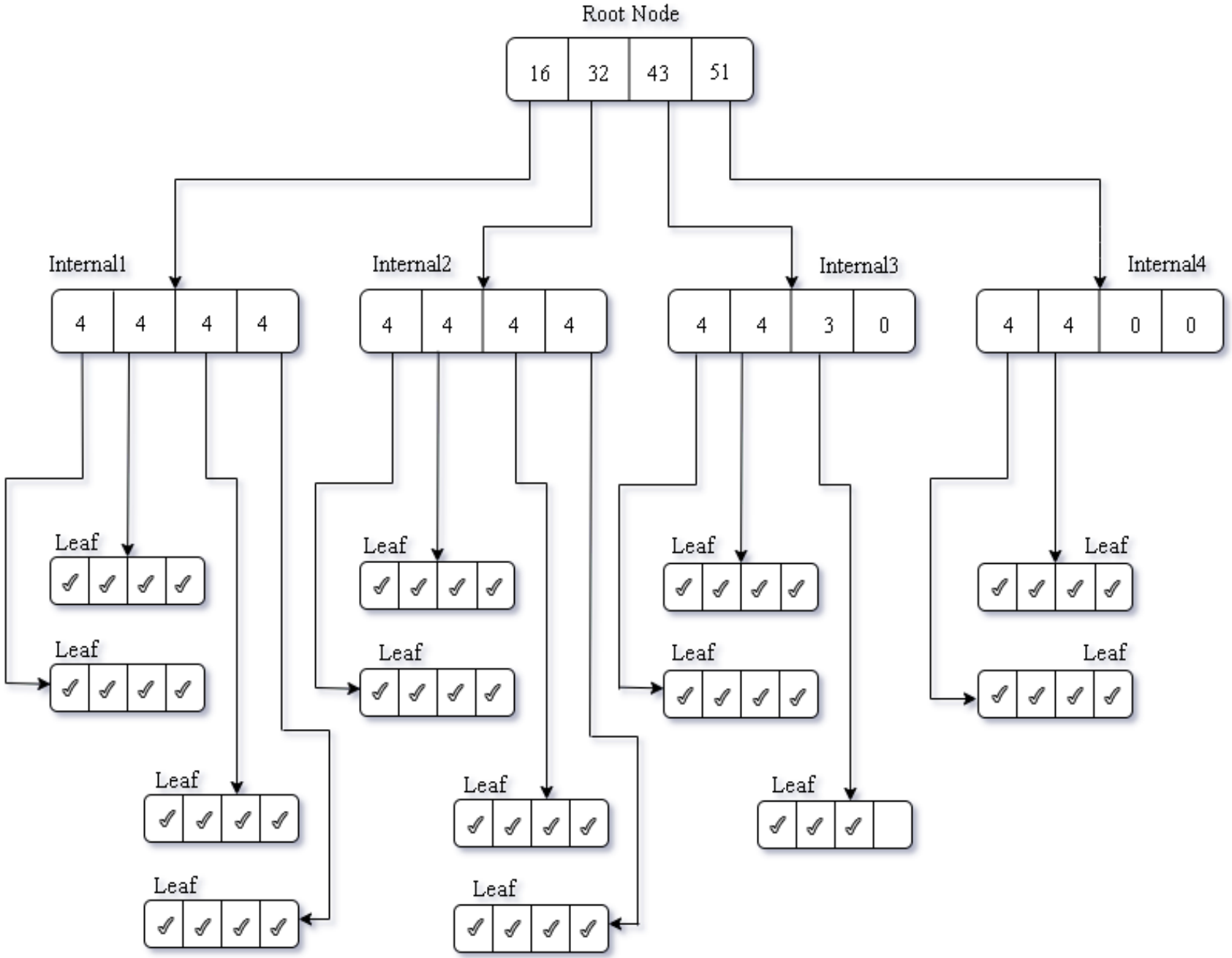


Delete-1

- Delete 5 lines at pos 40

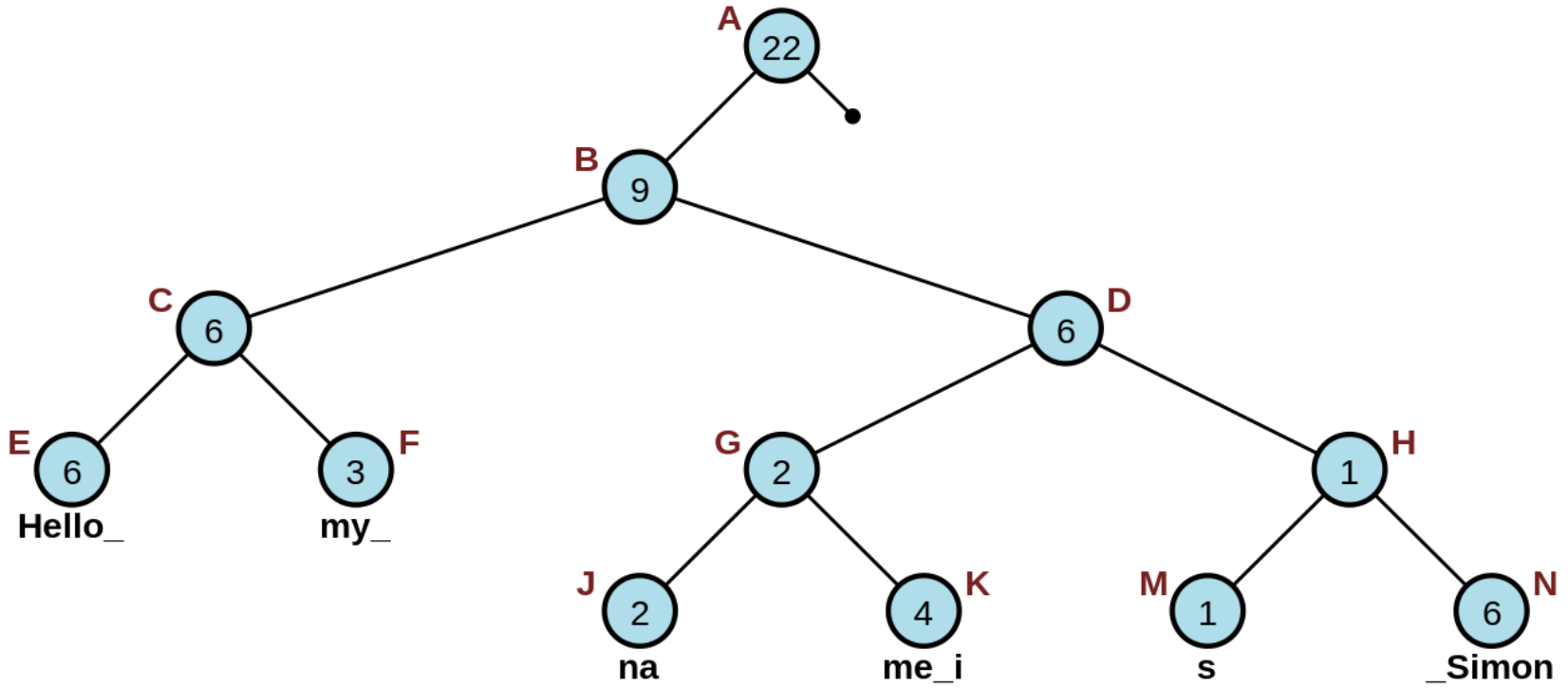


Delete-2


Root Node
16
32
43
51
Internal1
4
4
4
4
Internal2
4
4
4
4
Internal3
4
4
3
0
Internal4
4
4
0
0
Leaf
Leaf
Leaf
Leaf
Leaf
Leaf
Leaf
Leaf
Leaf
Leaf
Leaf
Leaf

Literature

- Ropes



How are we different?

- Ropes

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