

Banco de Dados

Indexação

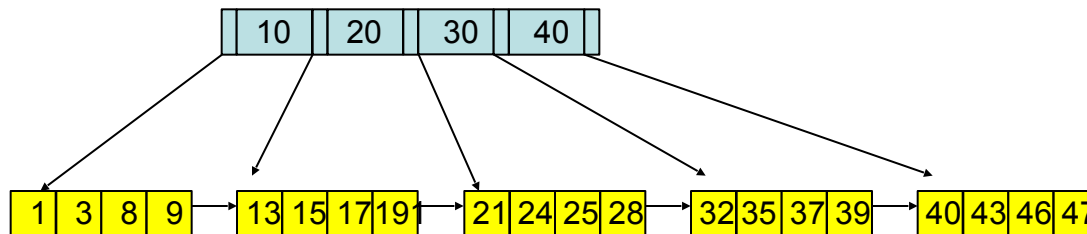
Prof. Joao Eduardo Ferreira
Prof. Osvaldo Kotaro Takai

- Este material apresenta uma simulação dos algoritmos de inserção e remoção de árvore B proposto por Raghu Ramakrishnan. Detalhes do algoritmo podem ser encontrados em:
- Database Management System pg.: 256 – 264, para detalhes vide bibliografia.
- <http://www.ime.usp.br/~jef/Btree.pdf>

Lista de valores

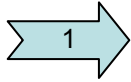
7

Root



Lista de valores

7



Root

10 20 30 40

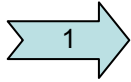
Folhas

1 3 8 9 → 13 15 17 19 → 21 24 25 28 → 32 35 37 39 → 40 43 46 47

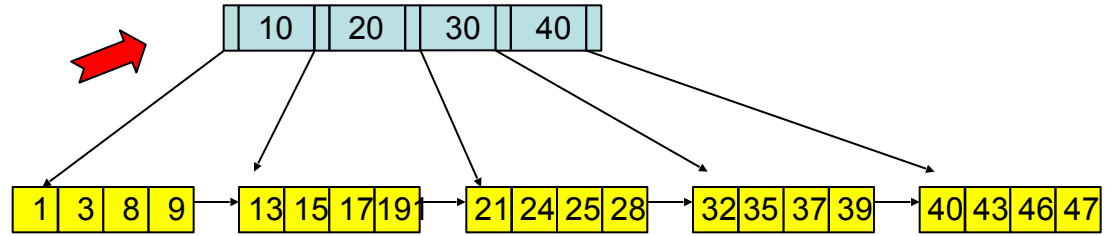
Insert(root, 7, newchildentry)

Lista de valores

7



Root

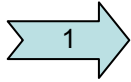


Folhas

Insert(root, 7, newchildentry)

Lista de valores

7



Root

10 20 30 40



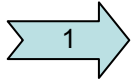
Folhas

1 3 8 9 → 13 15 17 19 → 21 24 25 28 → 32 35 37 39 → 40 43 46 47

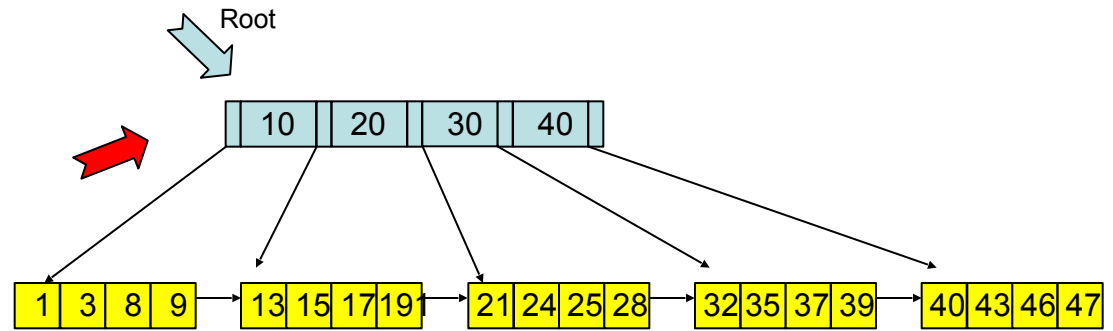
(is non-leaf)

Lista de valores

7



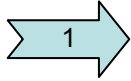
Folhas



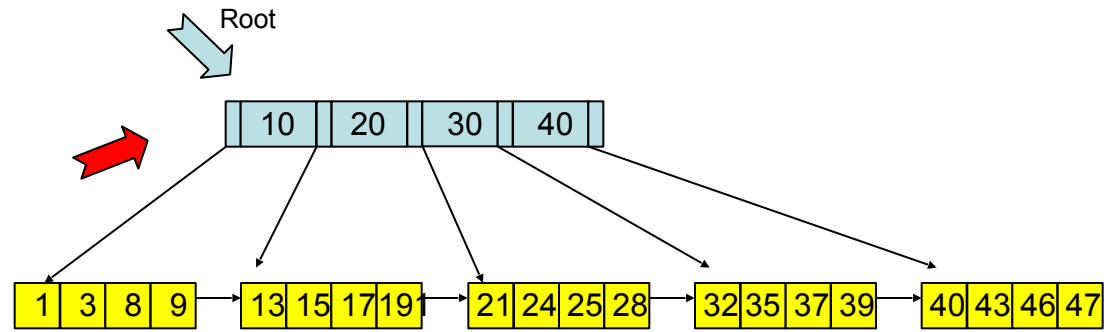
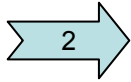
Find i such that $K_i \leq \text{entry's keyvalue} < K_{i+1}$

Lista de valores

7



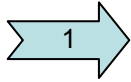
Folhas



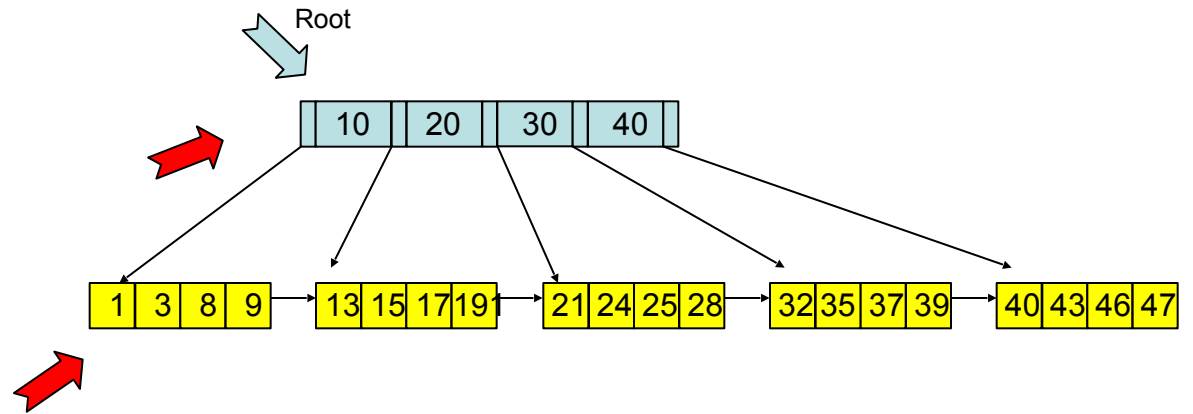
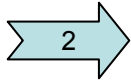
Insert(Pi, 7, newchildentry<NULL>)

Lista de valores

7



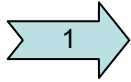
Folhas



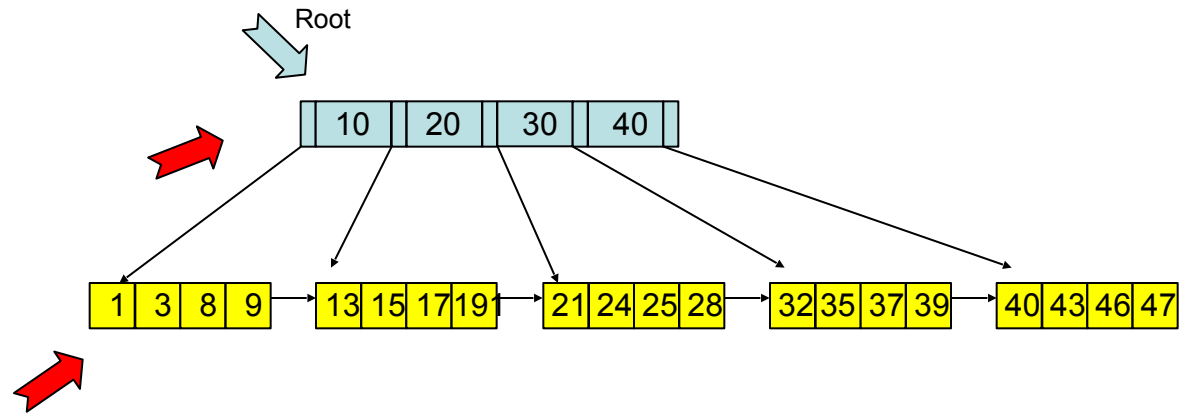
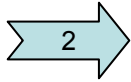
Insert(Pi, 7, newchildentry<NULL>)

Lista de valores

7



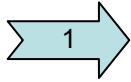
Folhas



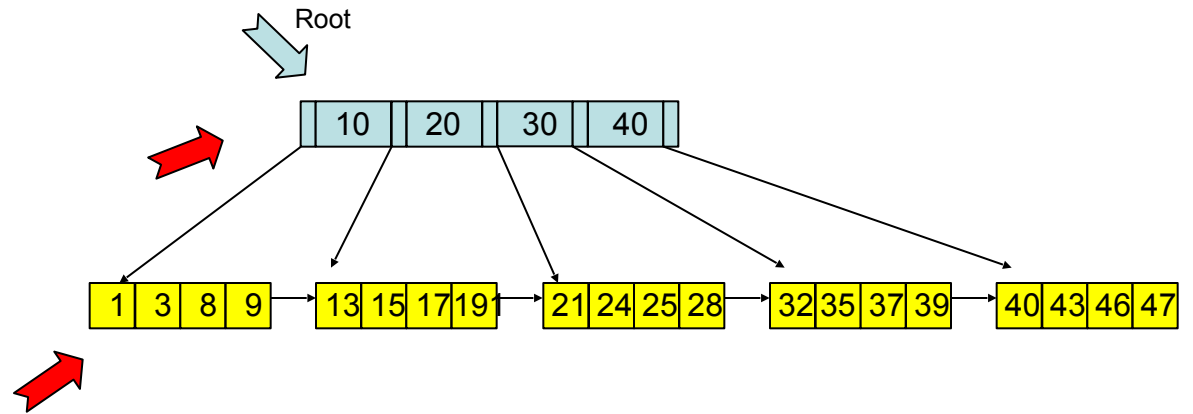
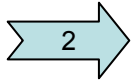
(is leaf)

Lista de valores

7



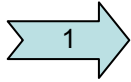
Folhas



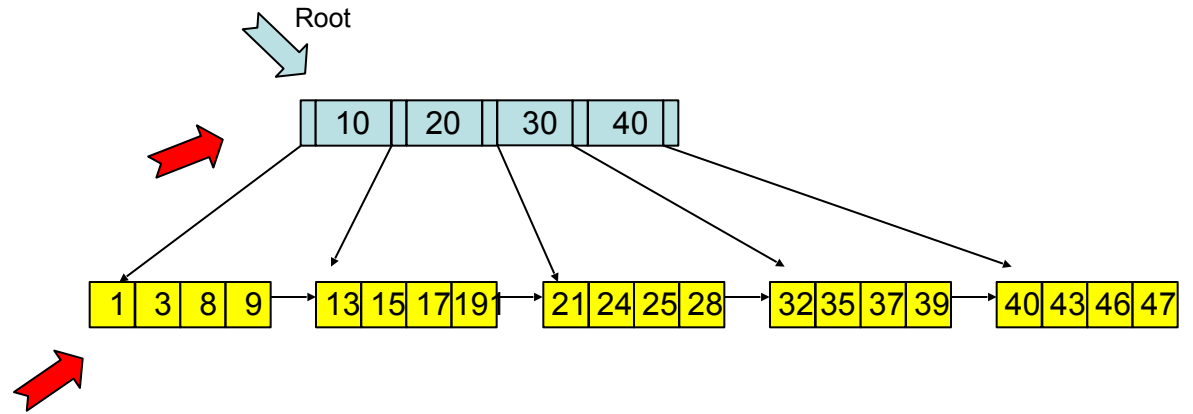
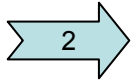
(has no space)

Lista de valores

7



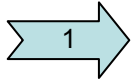
Folhas



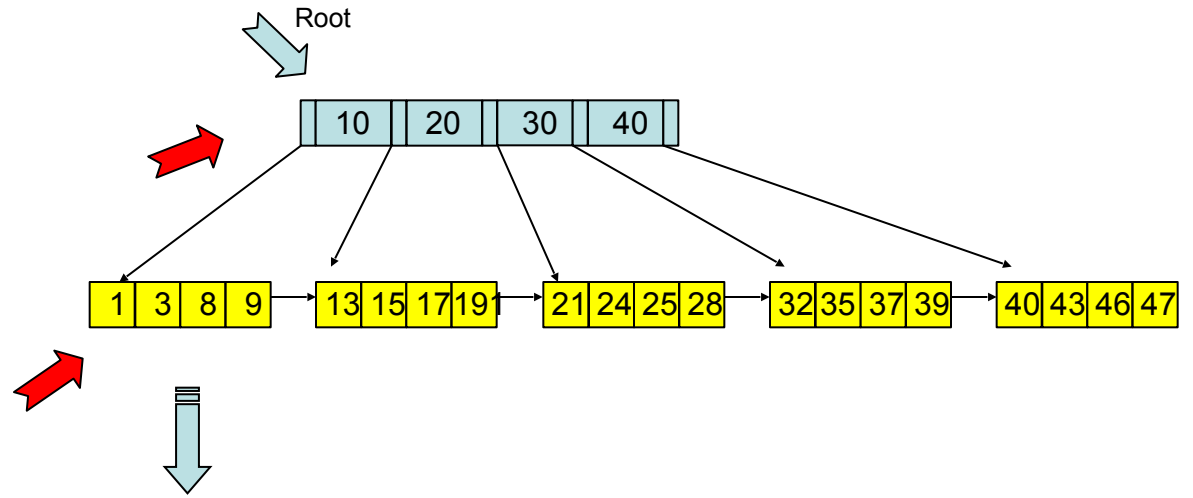
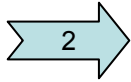
Split L

Lista de valores

7



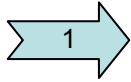
Folhas



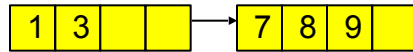
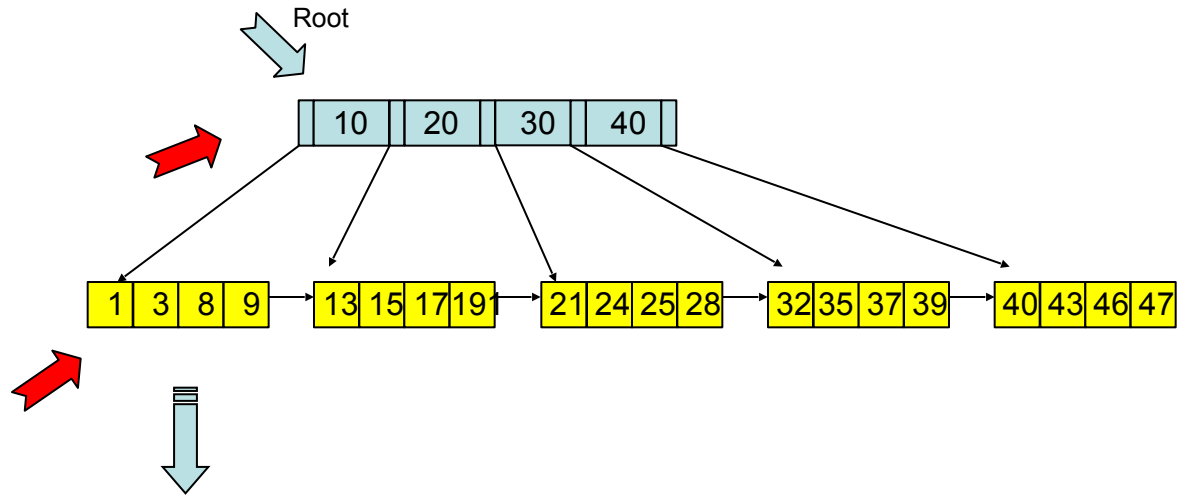
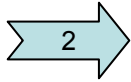
Split L

Lista de valores

7



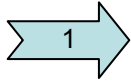
Folhas



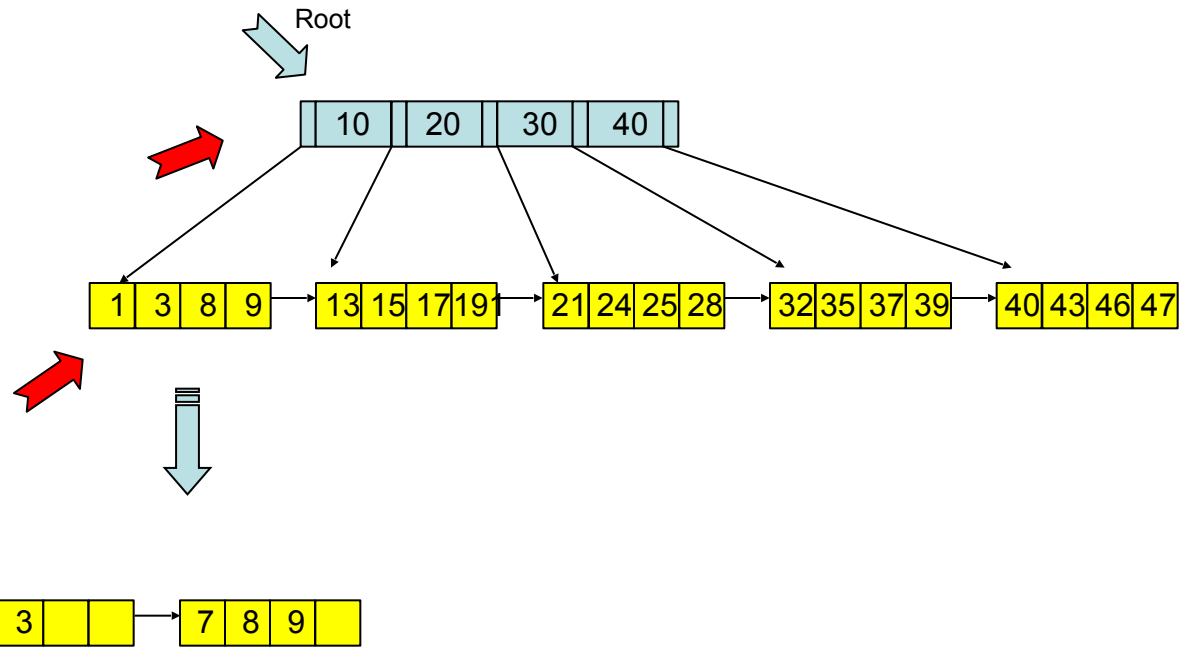
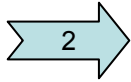
Split L

Lista de valores

7



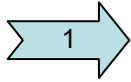
Folhas



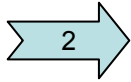
Newchildentry = &<7>

Lista de valores

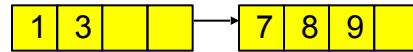
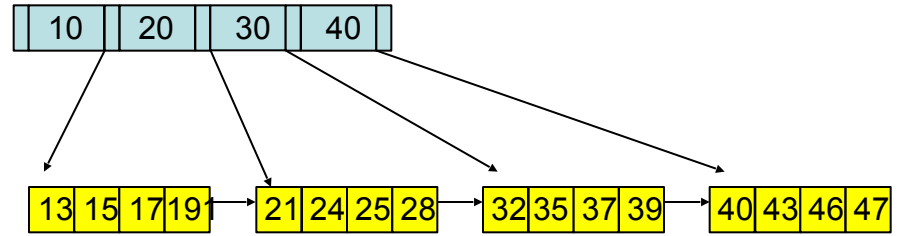
7



Folhas



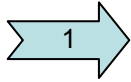
Root



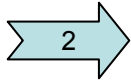
Newchildentry = &<7>

Lista de valores

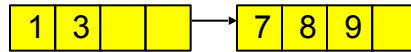
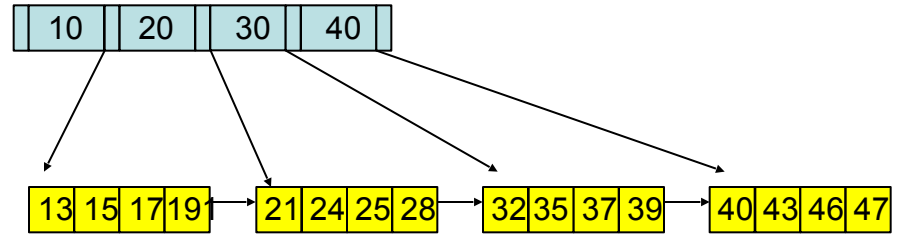
7



Folhas



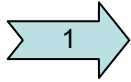
Root



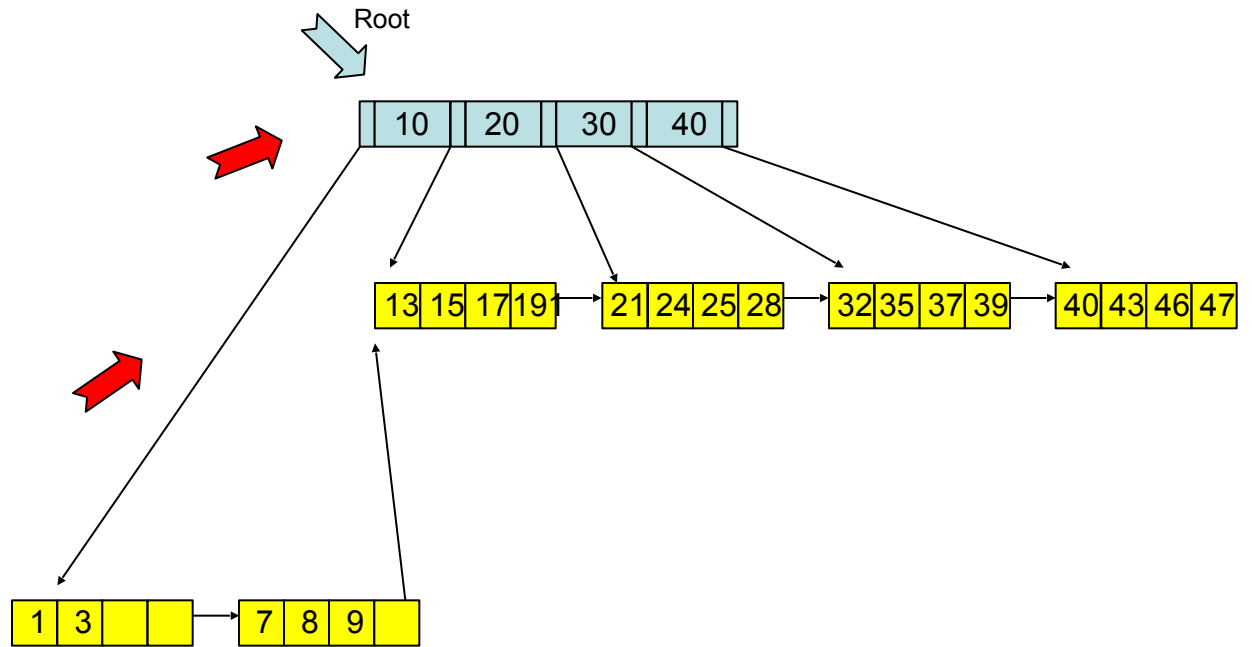
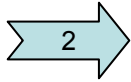
Newchildentry = &<7>

Lista de valores

7



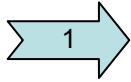
Folhas



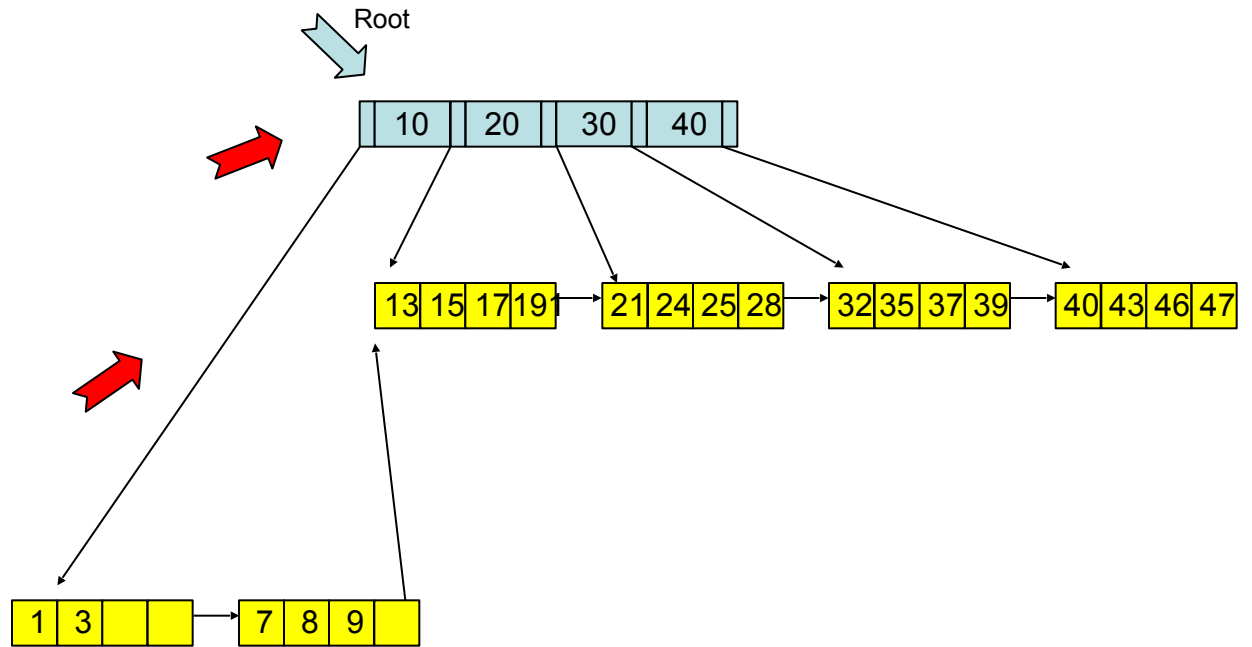
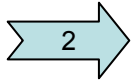
Set sibling pointers in L and L2

Lista de valores

7



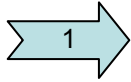
Folhas



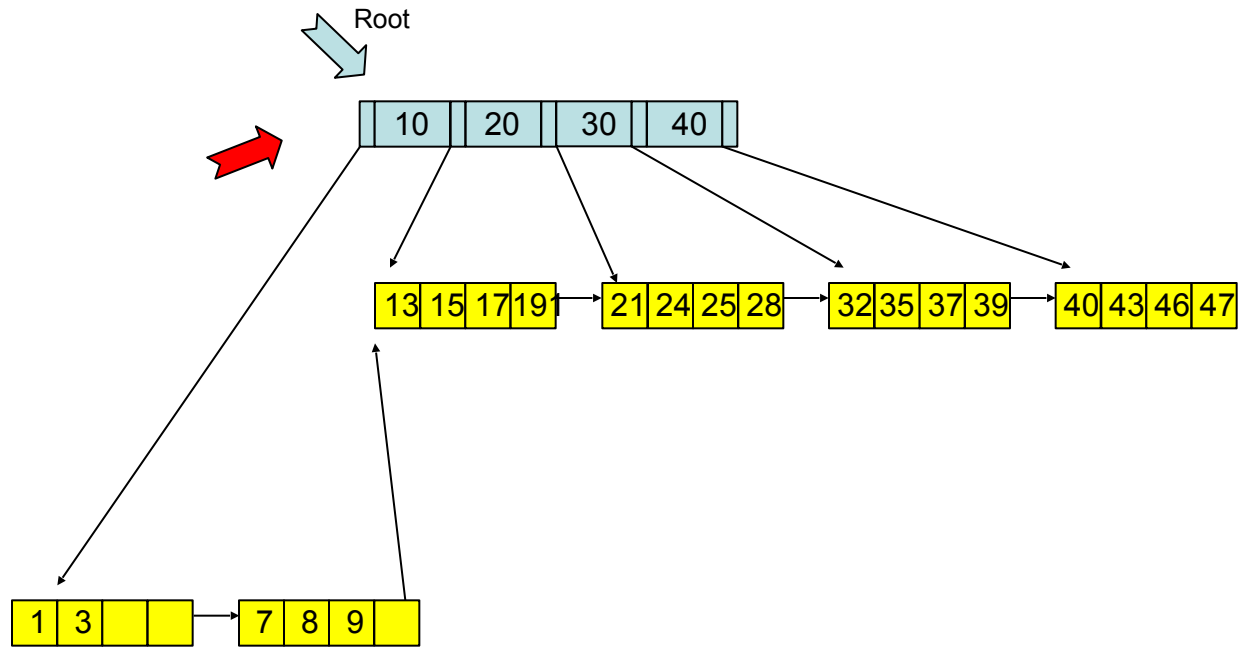
Return (newchildentry = &<7>)

Lista de valores

7



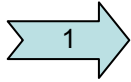
Folhas



Return (newchildentry = &<7>)

Lista de valores

7



Root



10 20 30 40

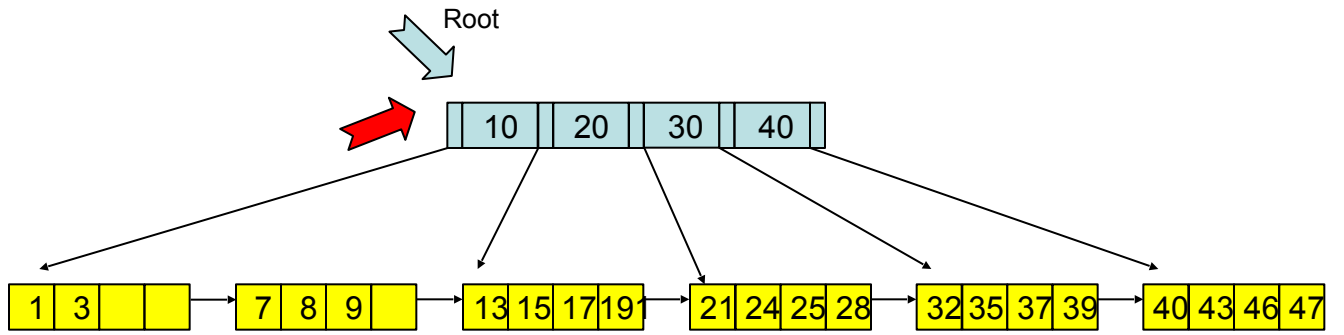
Folhas

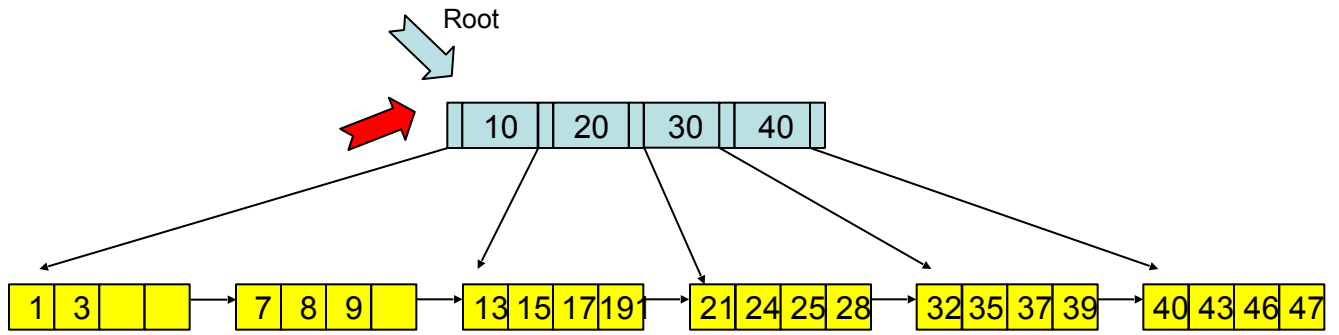
13 15 17 19 21 24 25 28 32 35 37 39 40 43 46 47

1 3 7 8 9

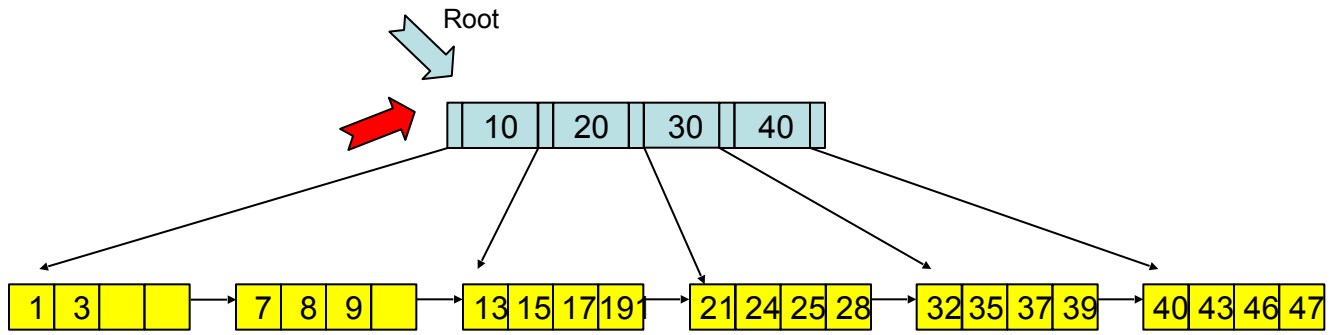
Return (newchildentry = &<7>)

Próxima Página

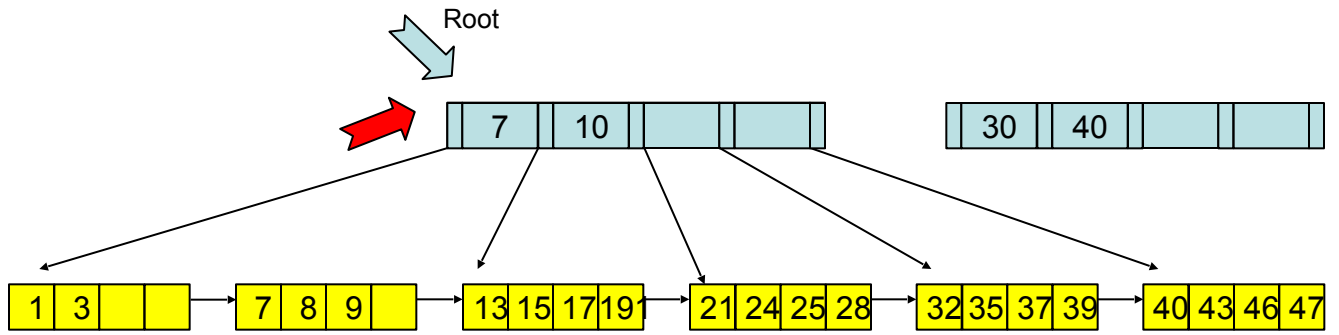


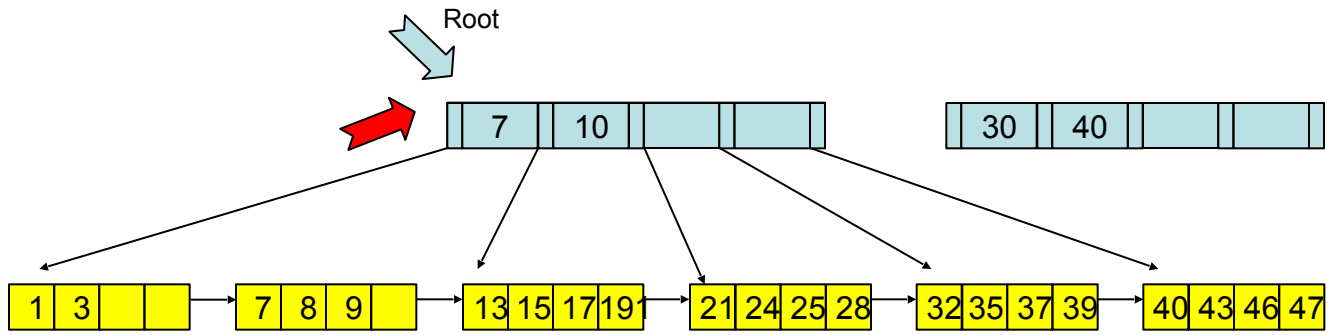


(has no space)

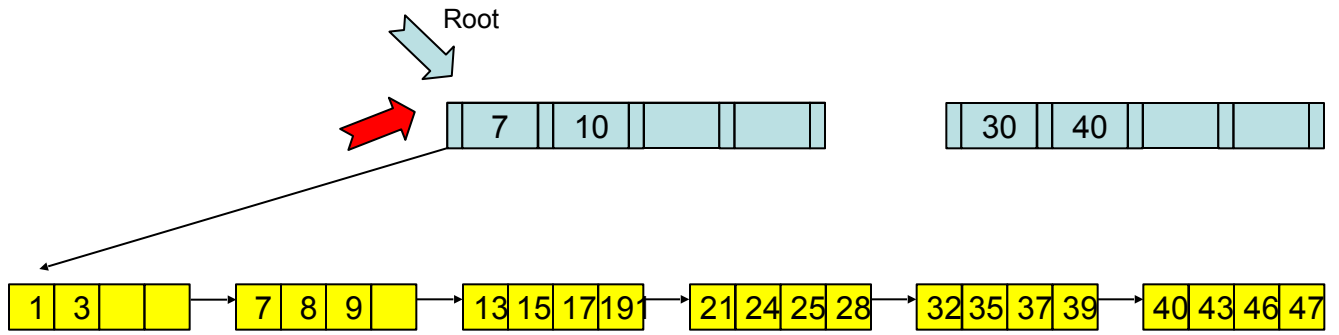


Split N

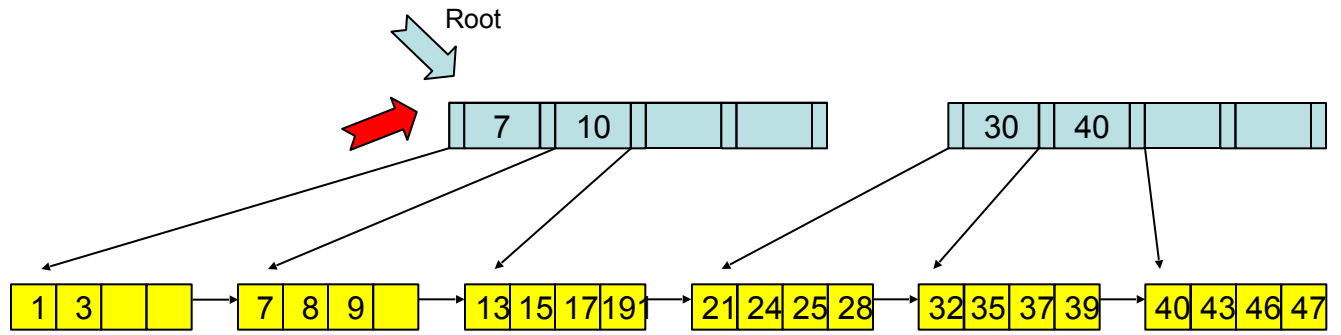




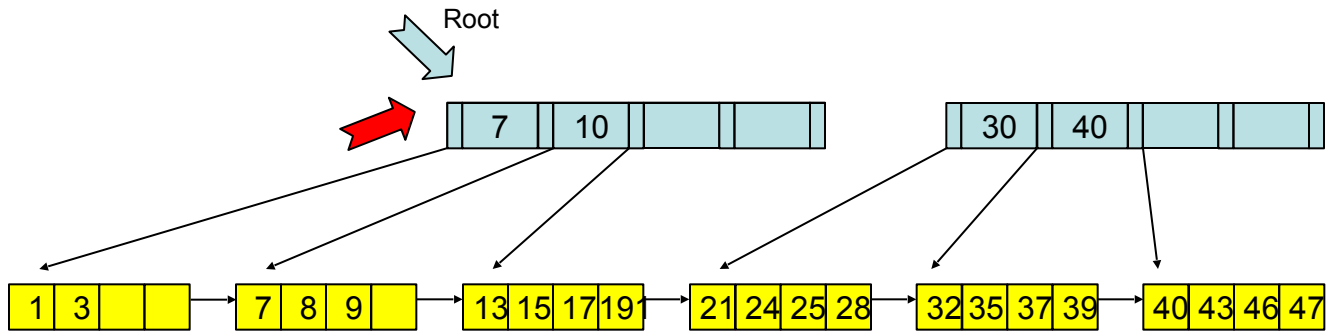
Newchildentry = &<20>



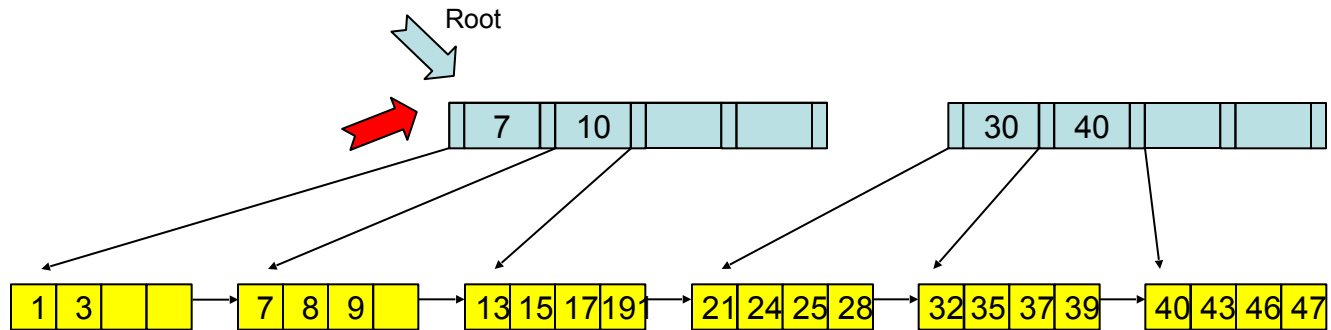
Newchildentry = &<20>



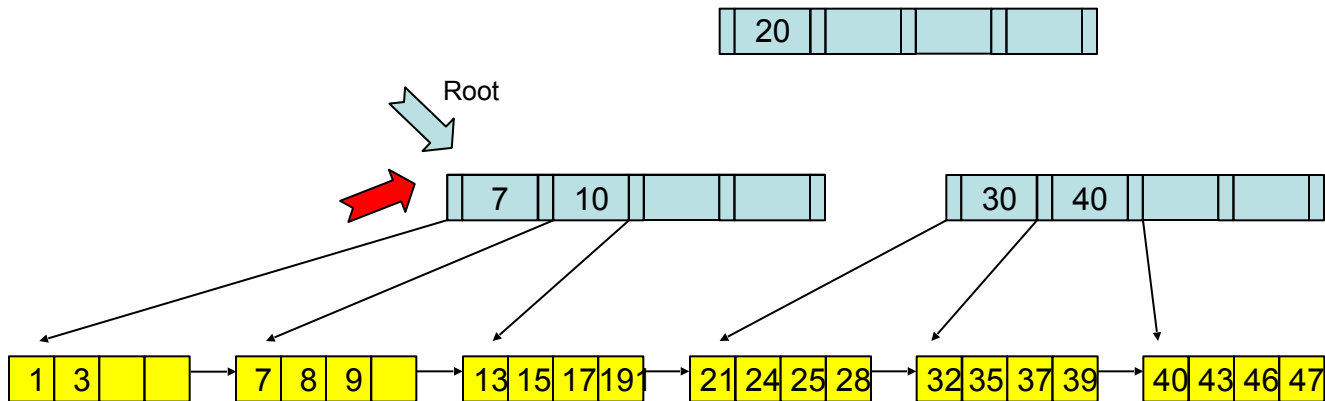
Newchildentry = &<20>



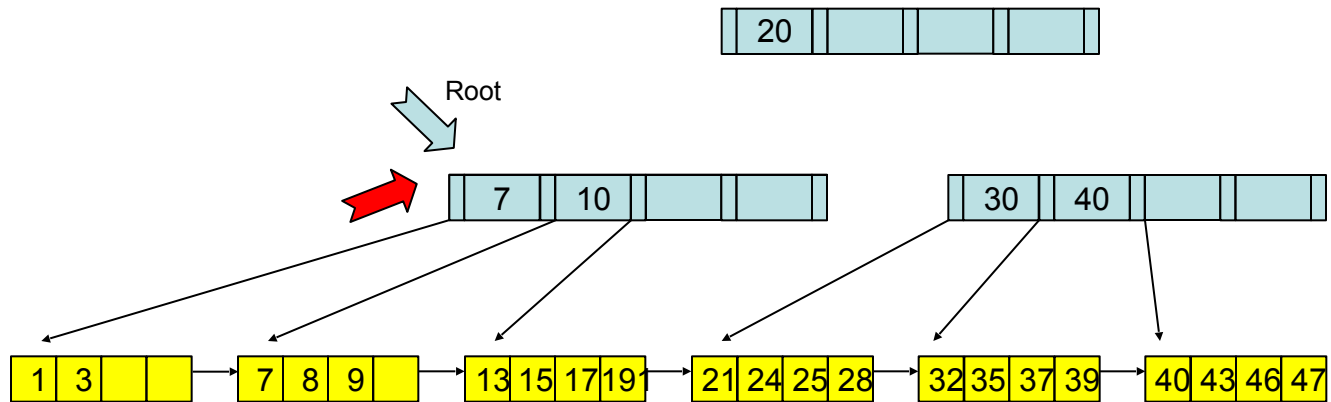
N is root



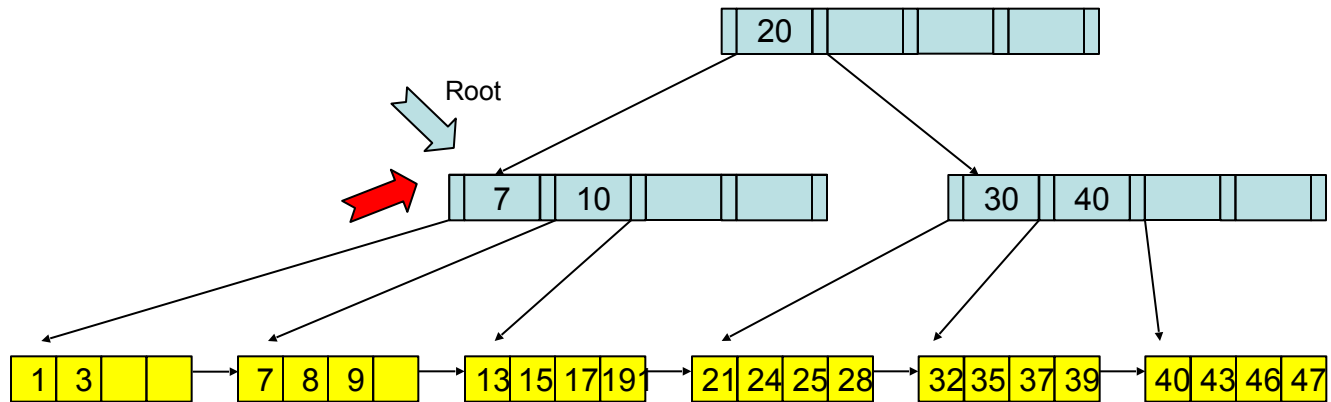
Create new node with (pointer to N, <20>)



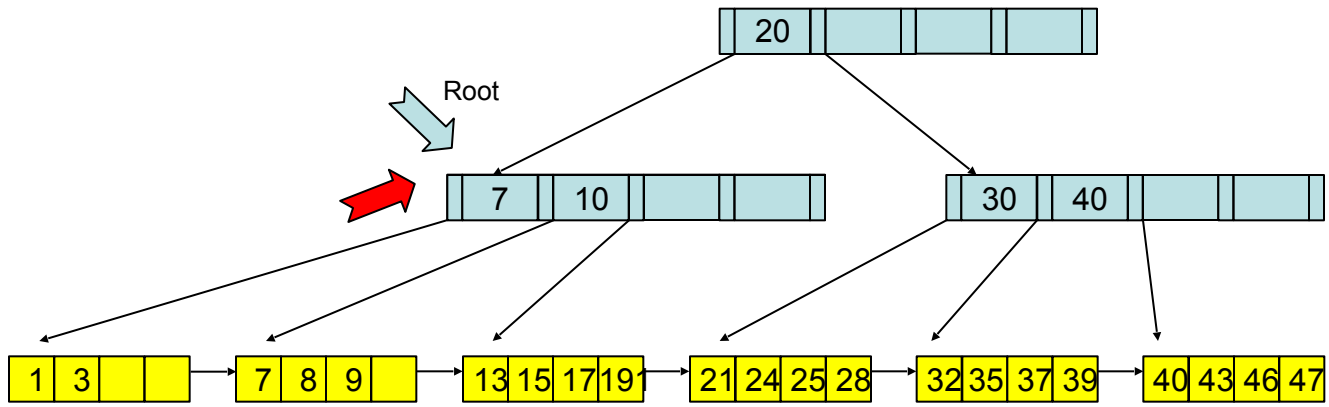
Create new node with (pointer to N, <20>)



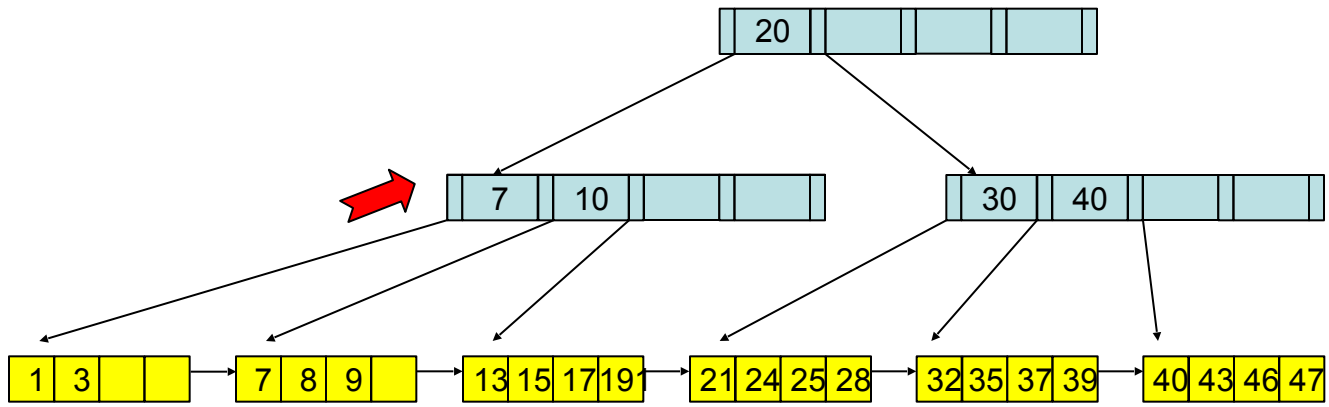
Make the tree's root-node pointer to the new node;



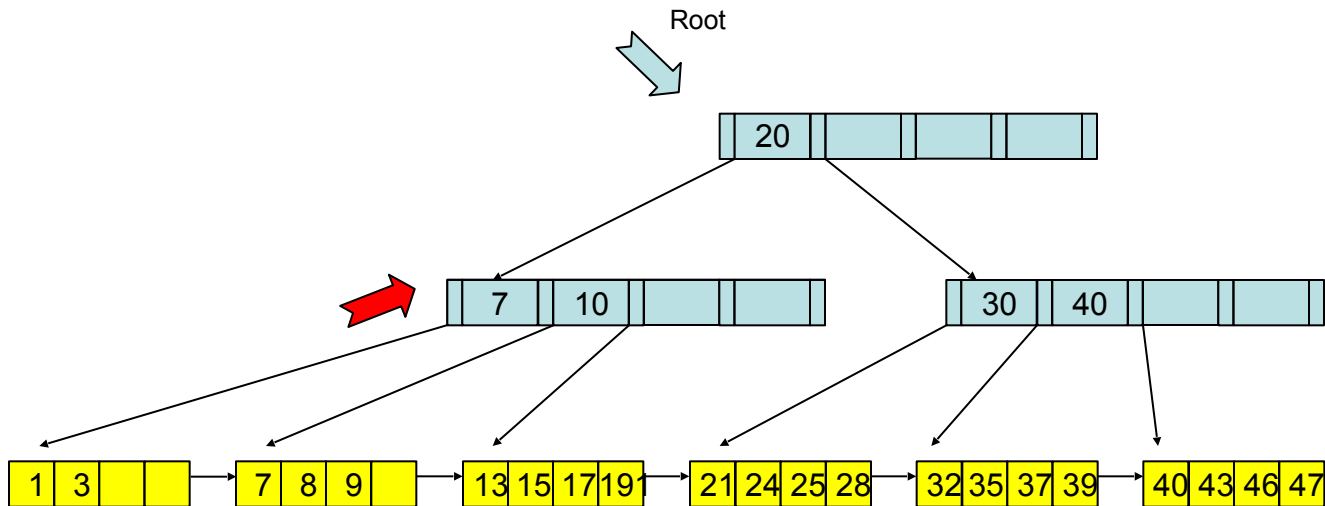
Make the tree's root-node pointer to the new node;



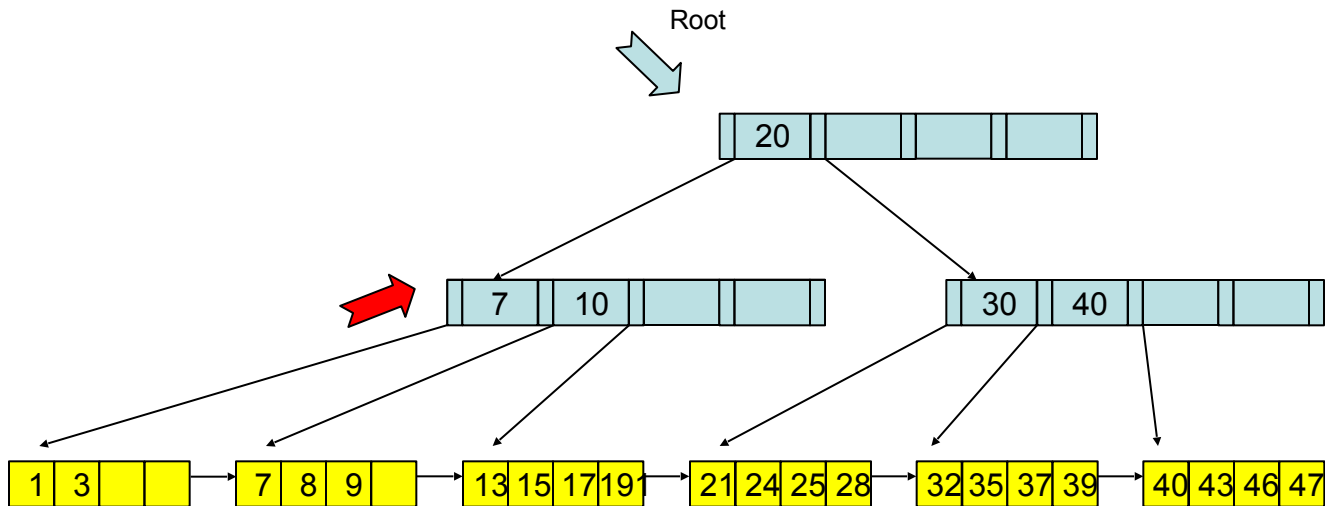
return



return



return



return

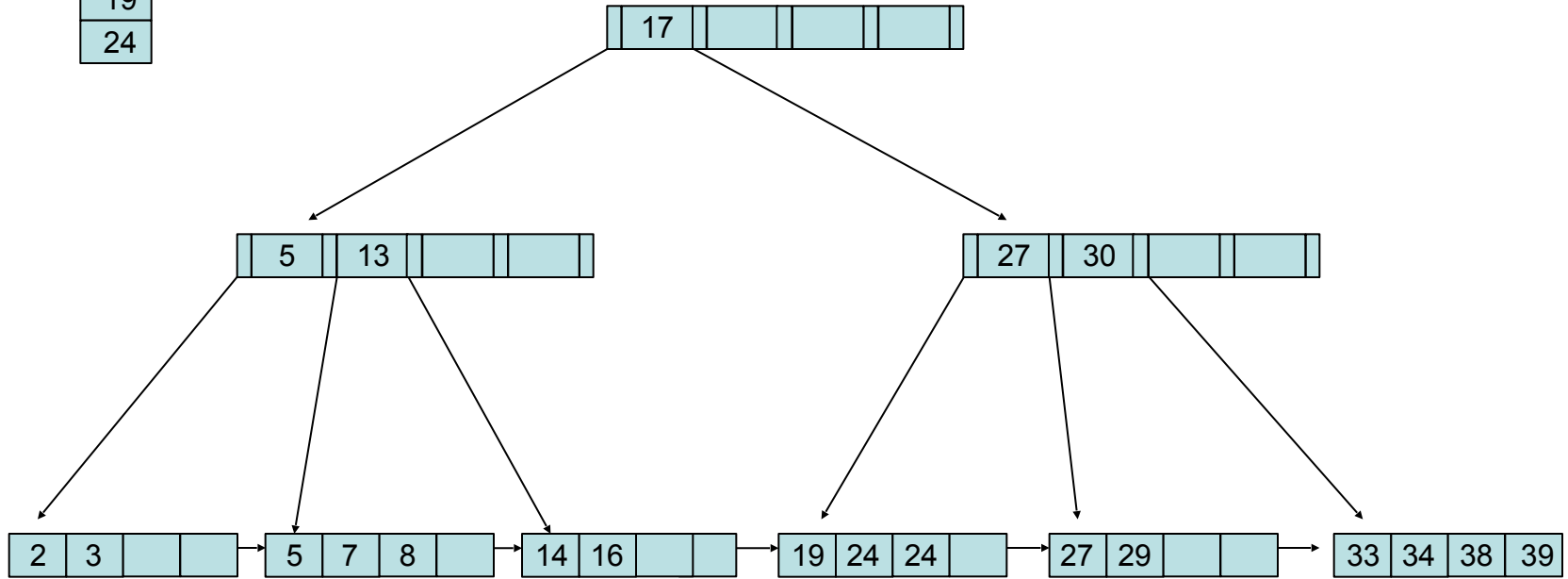
Fim

Algoritmo de Remoção

Raghu Ramakrishman

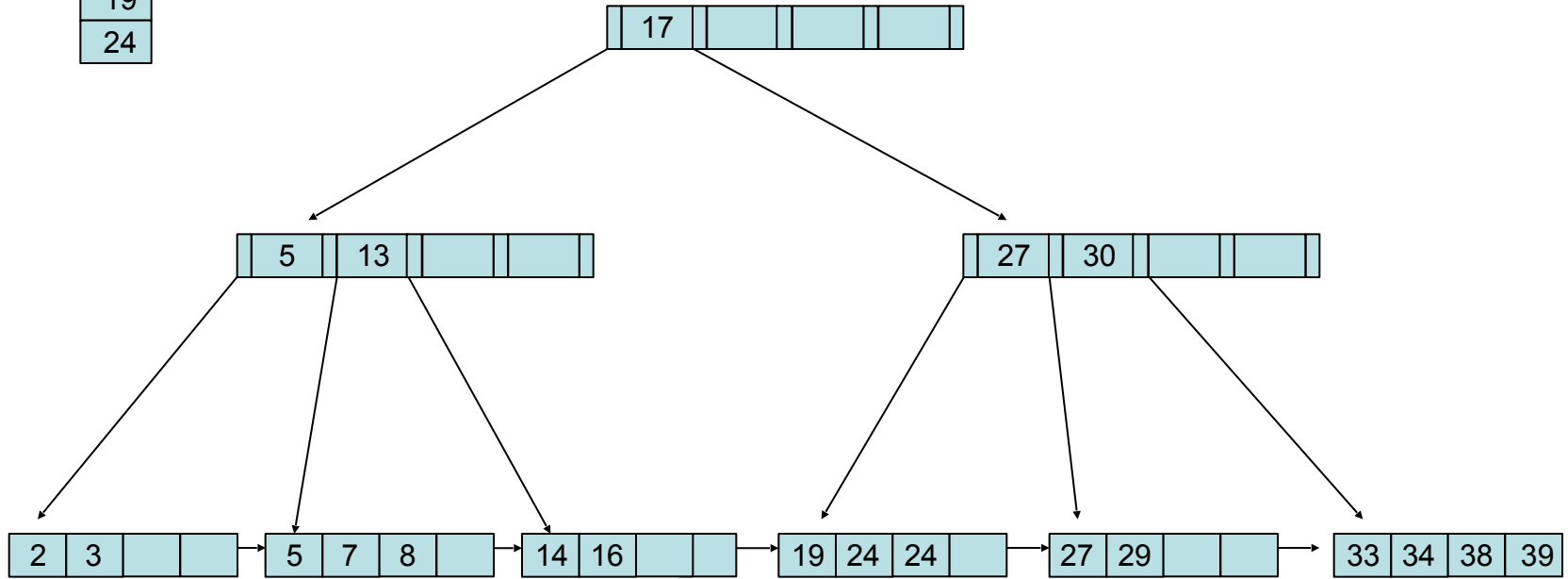
Lista de valores

19
24



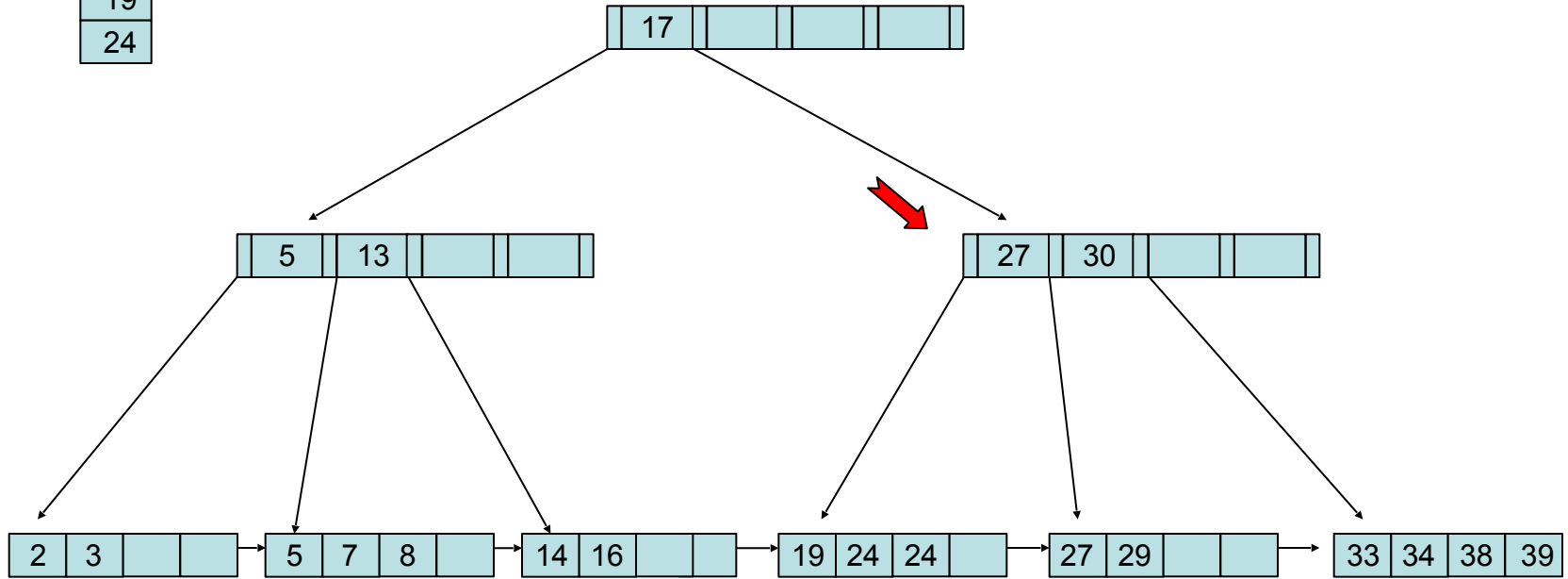
Lista de valores

19
24



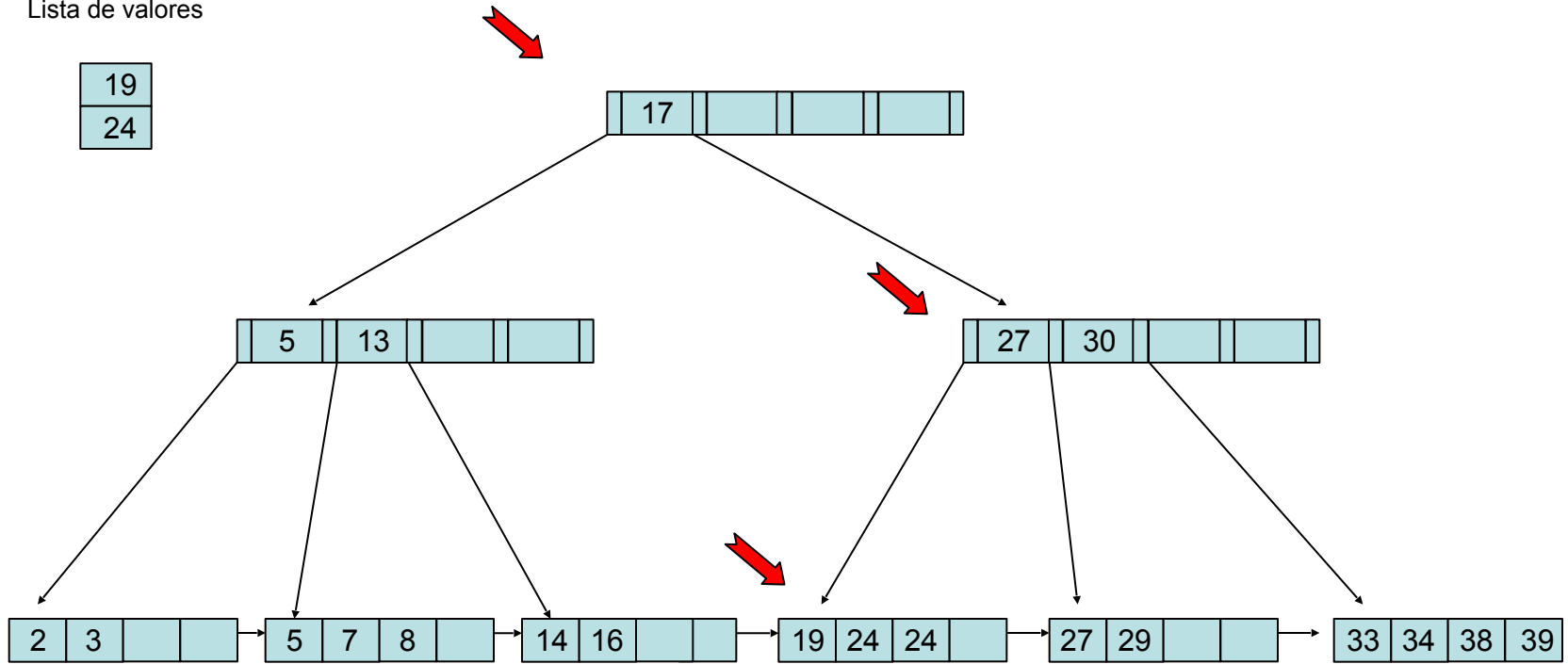
Lista de valores

19
24



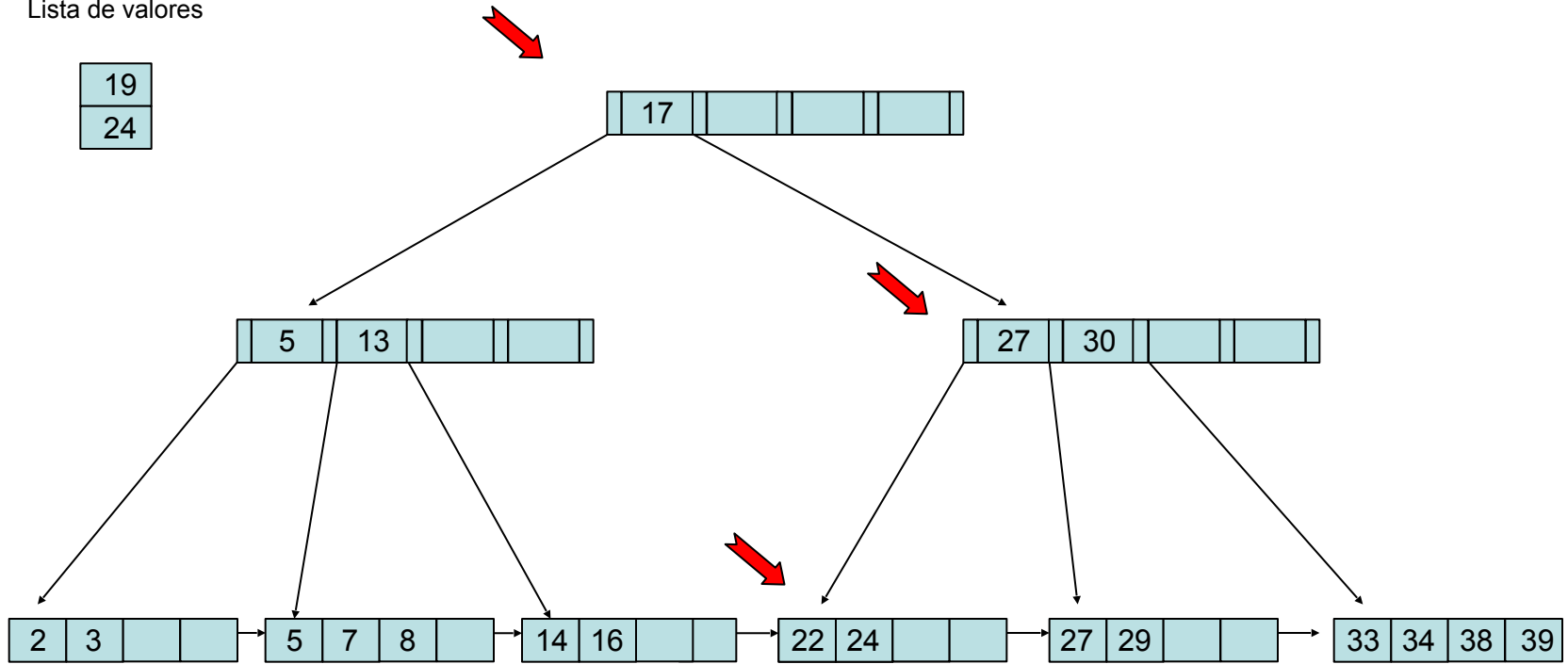
Lista de valores

19
24



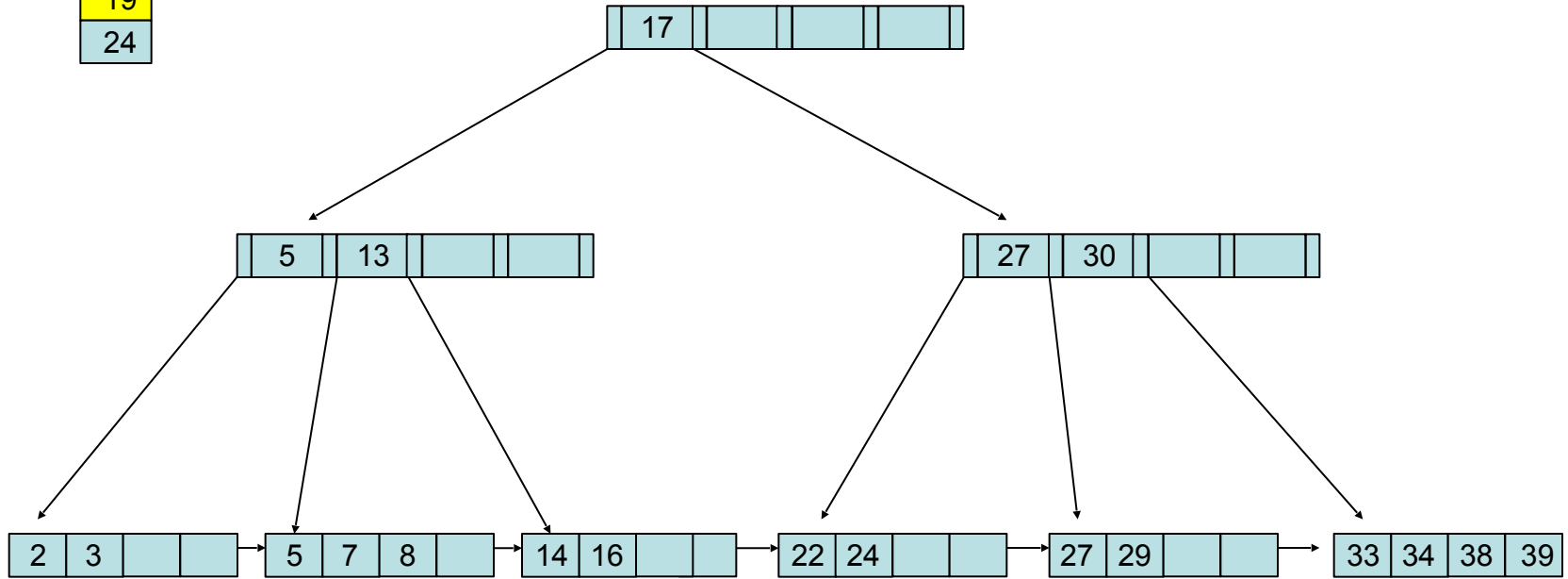
Lista de valores

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24



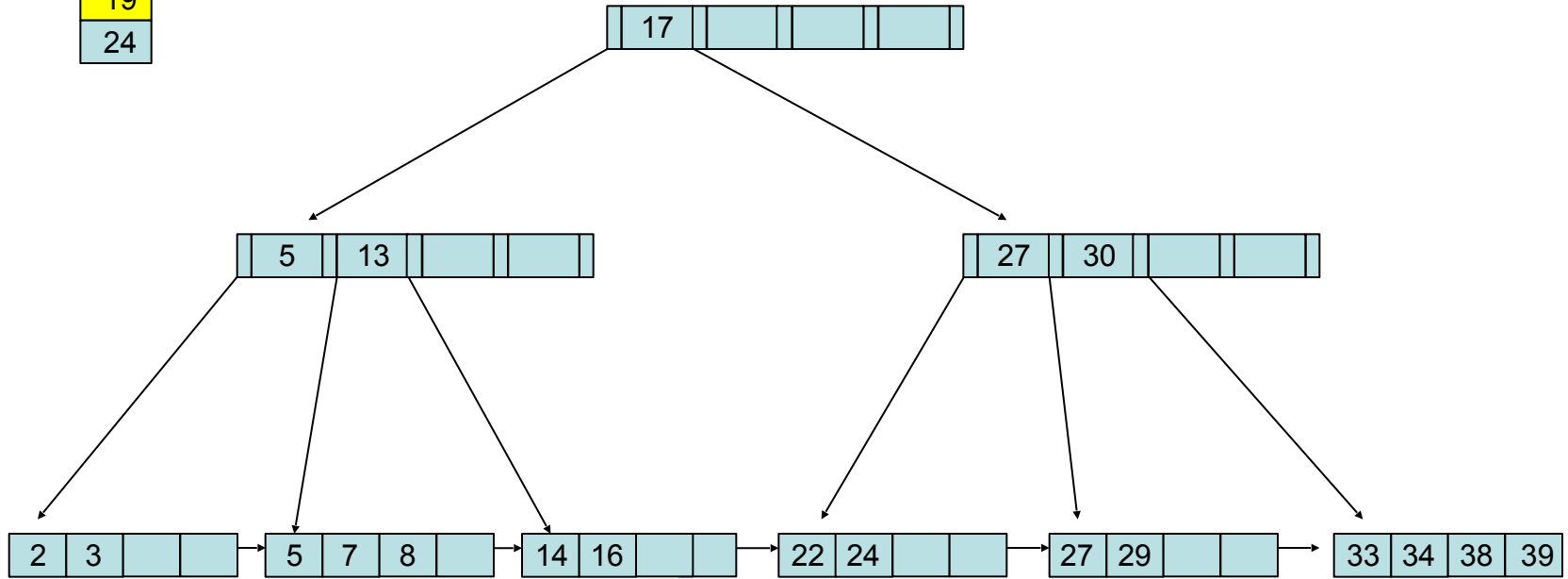
Lista de valores

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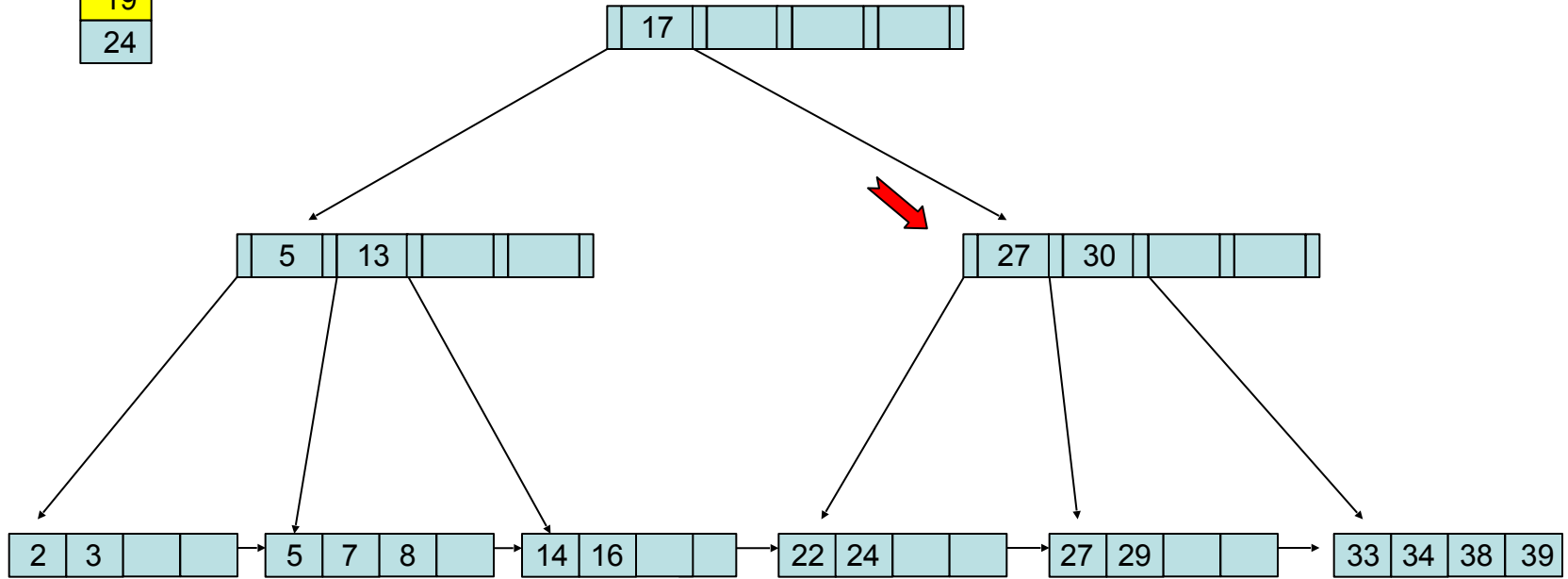
Lista de valores

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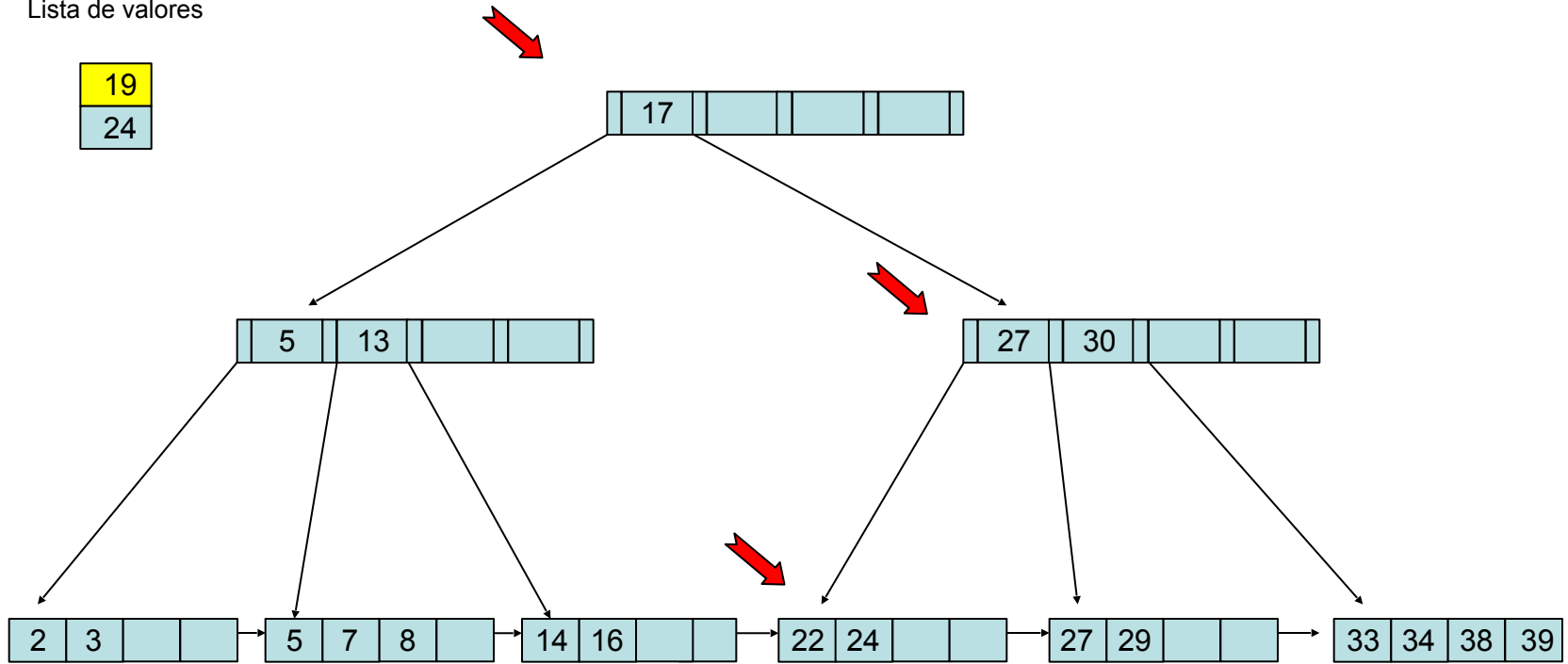
Lista de valores

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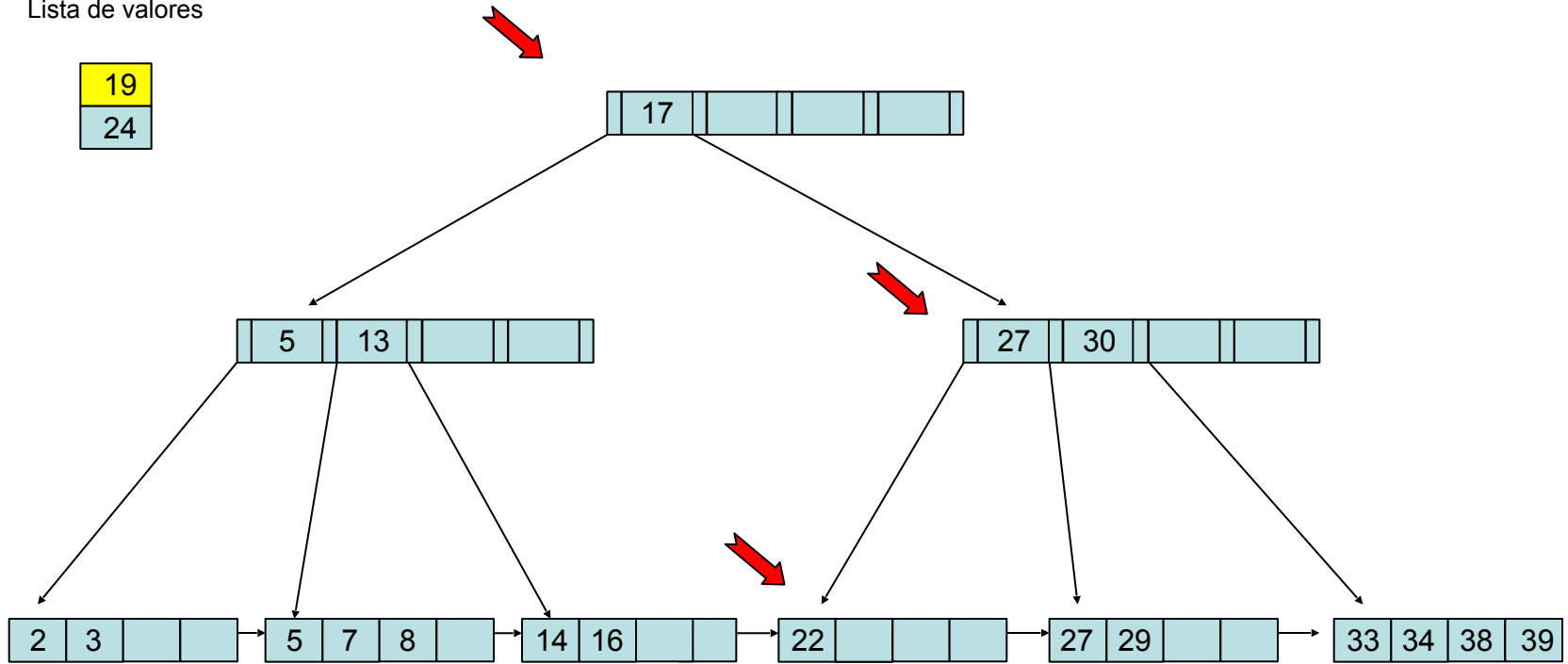
Lista de valores

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24



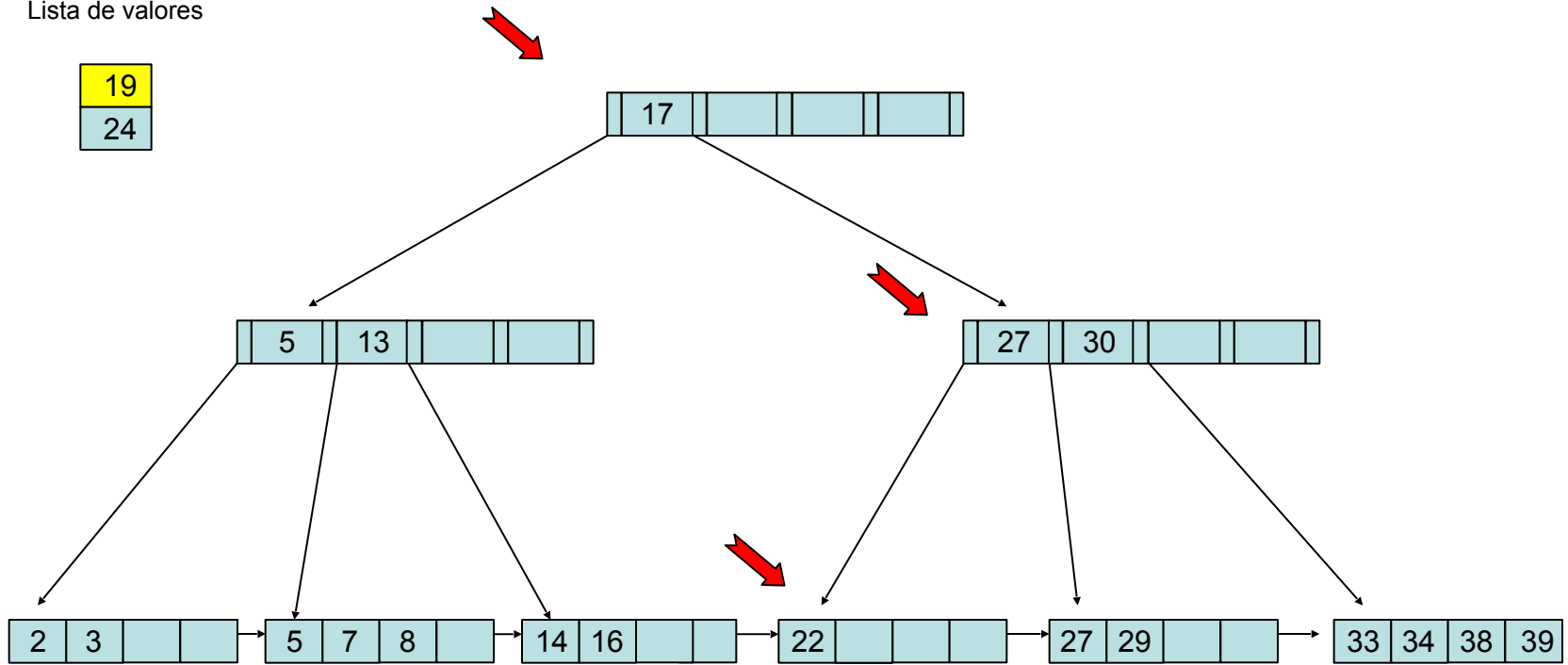
Lista de valores

19
24



Lista de valores

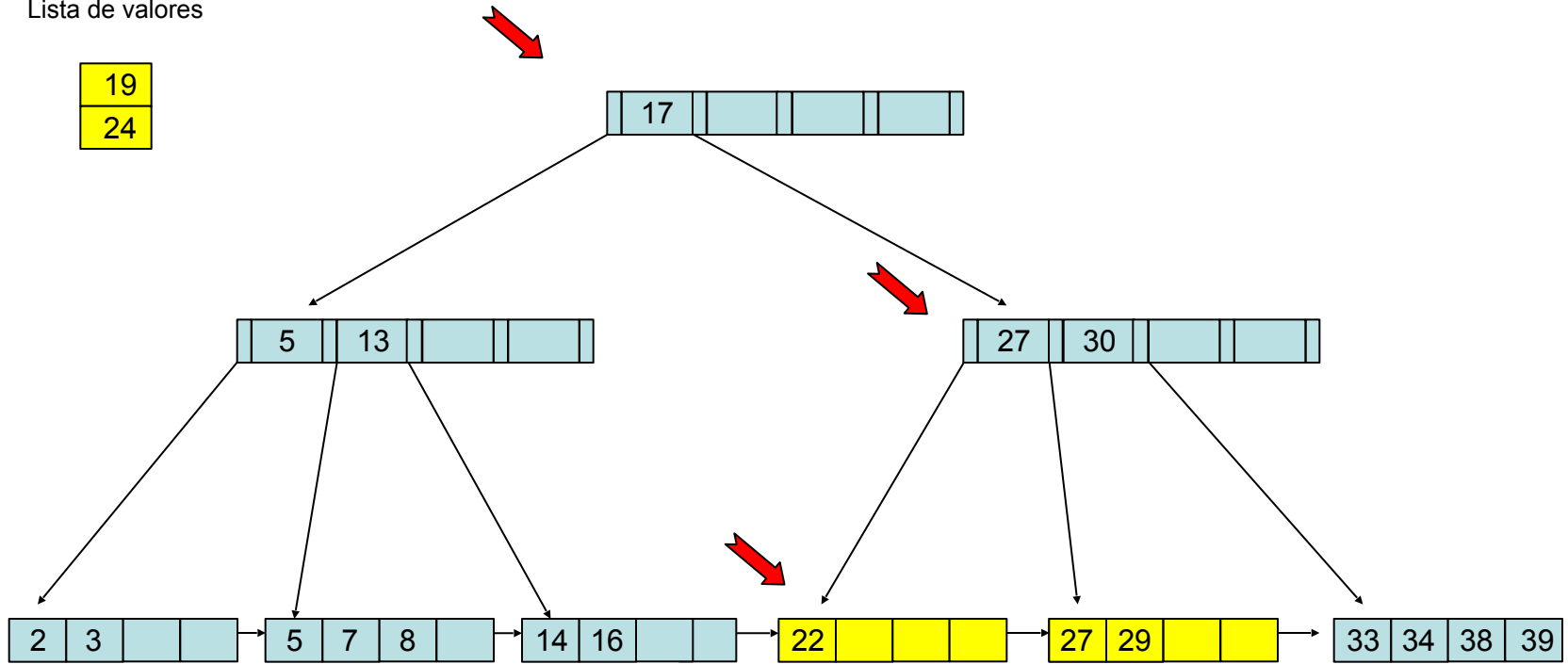
19
24



Próximo

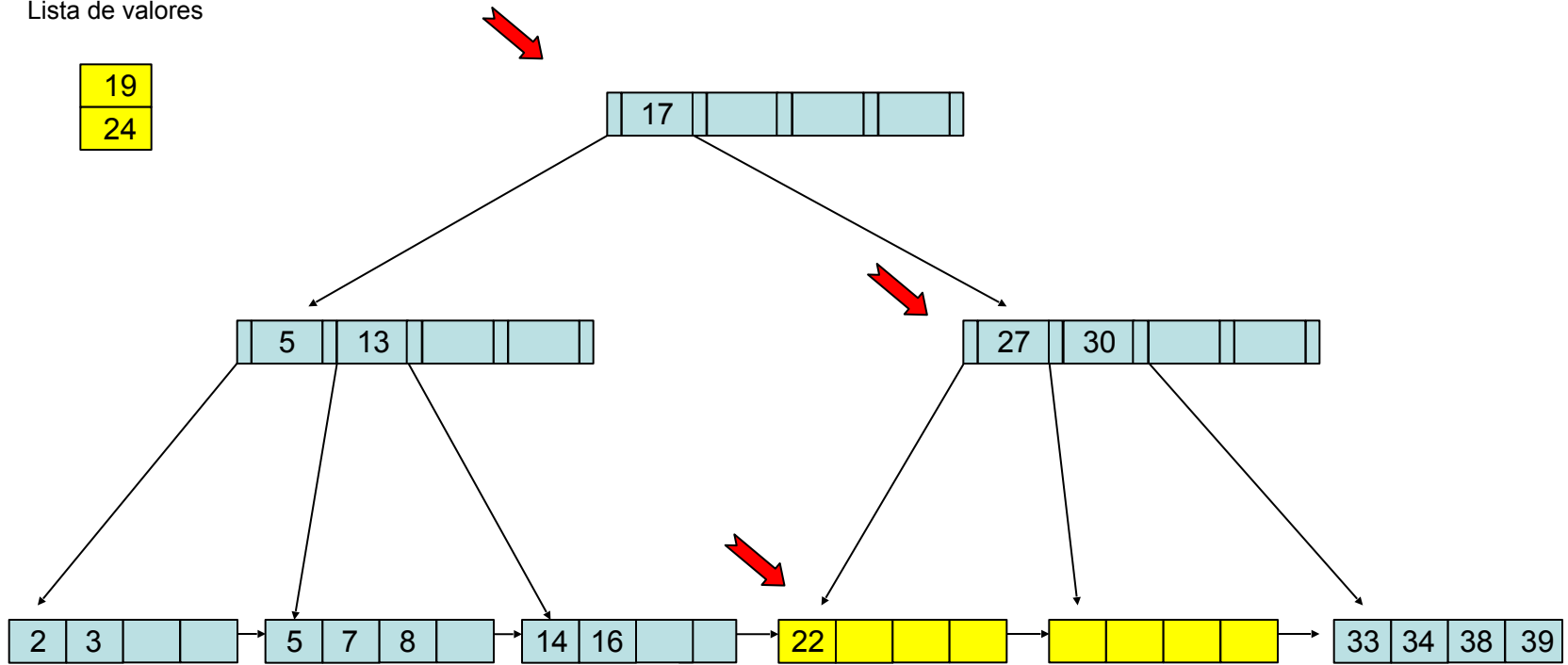
Lista de valores

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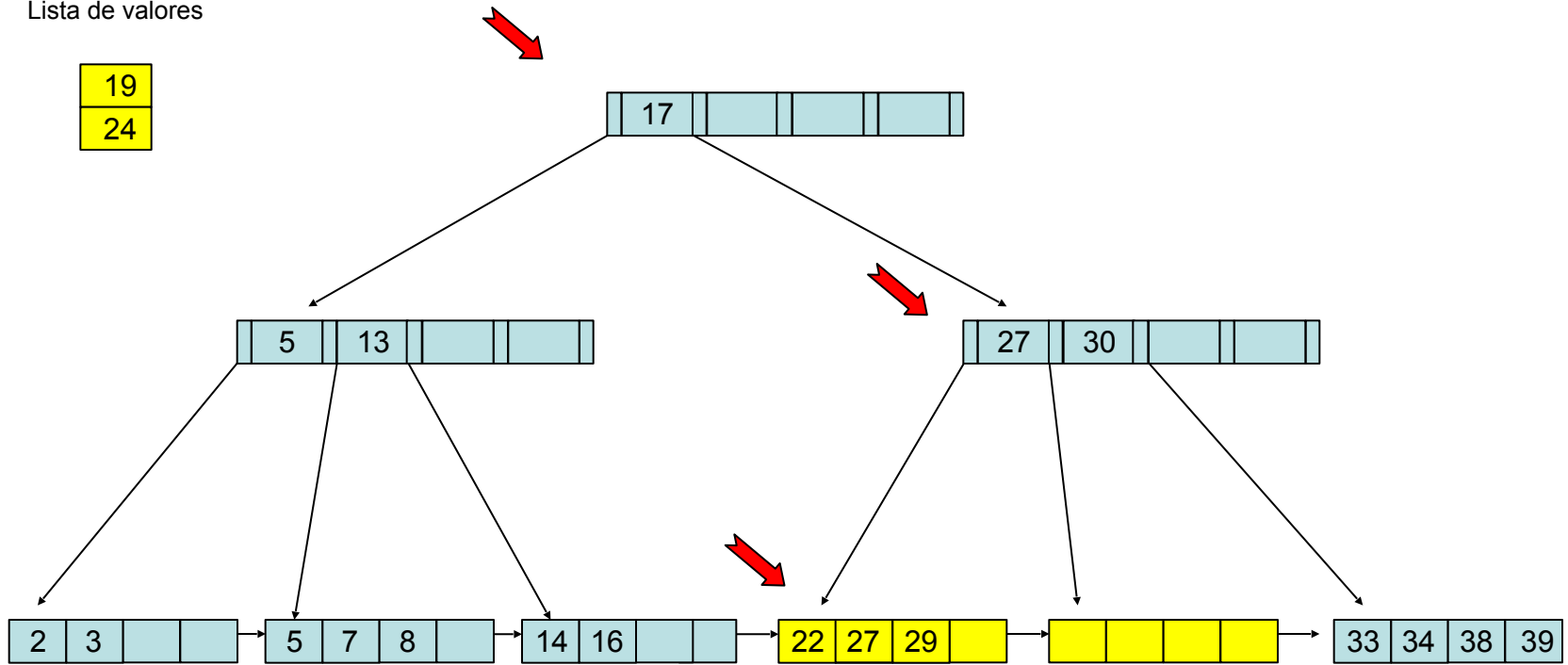
Lista de valores

19
24



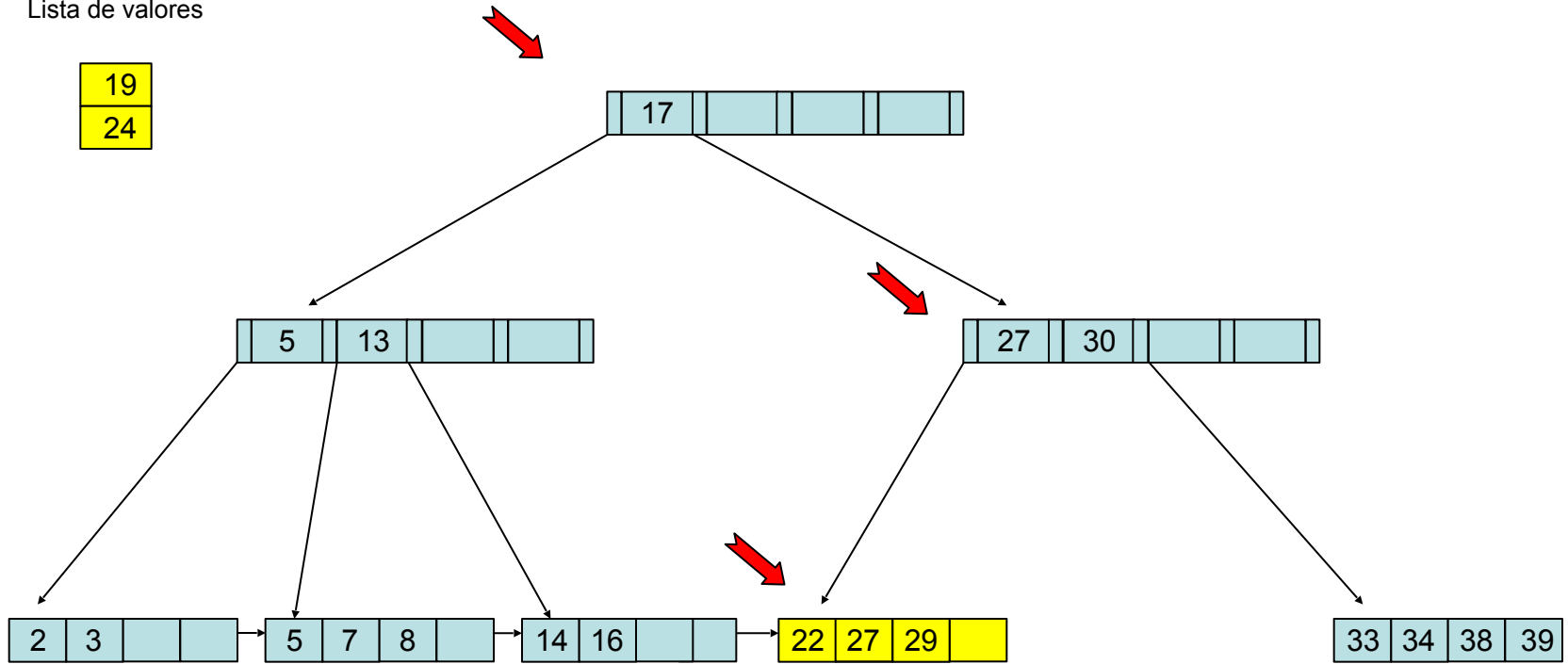
Lista de valores

19
24



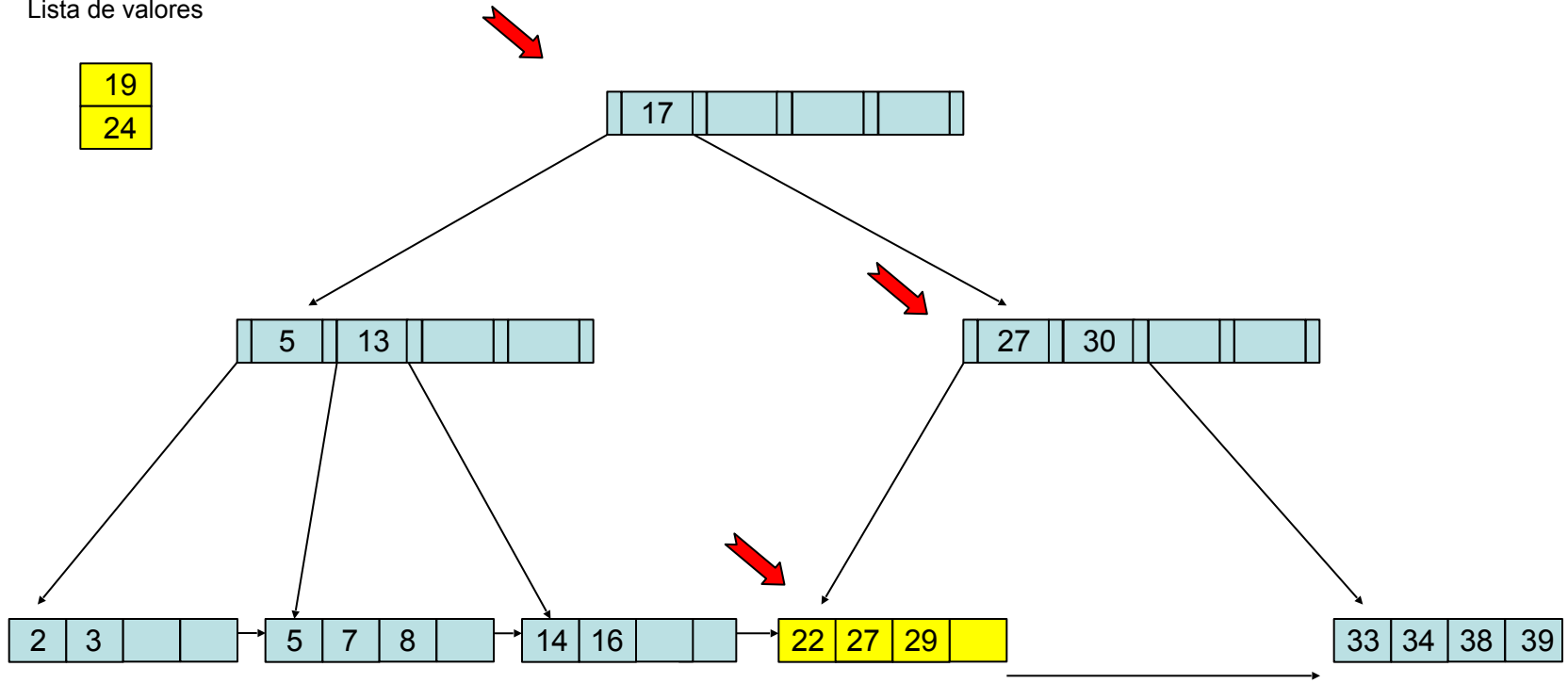
Lista de valores

19
24



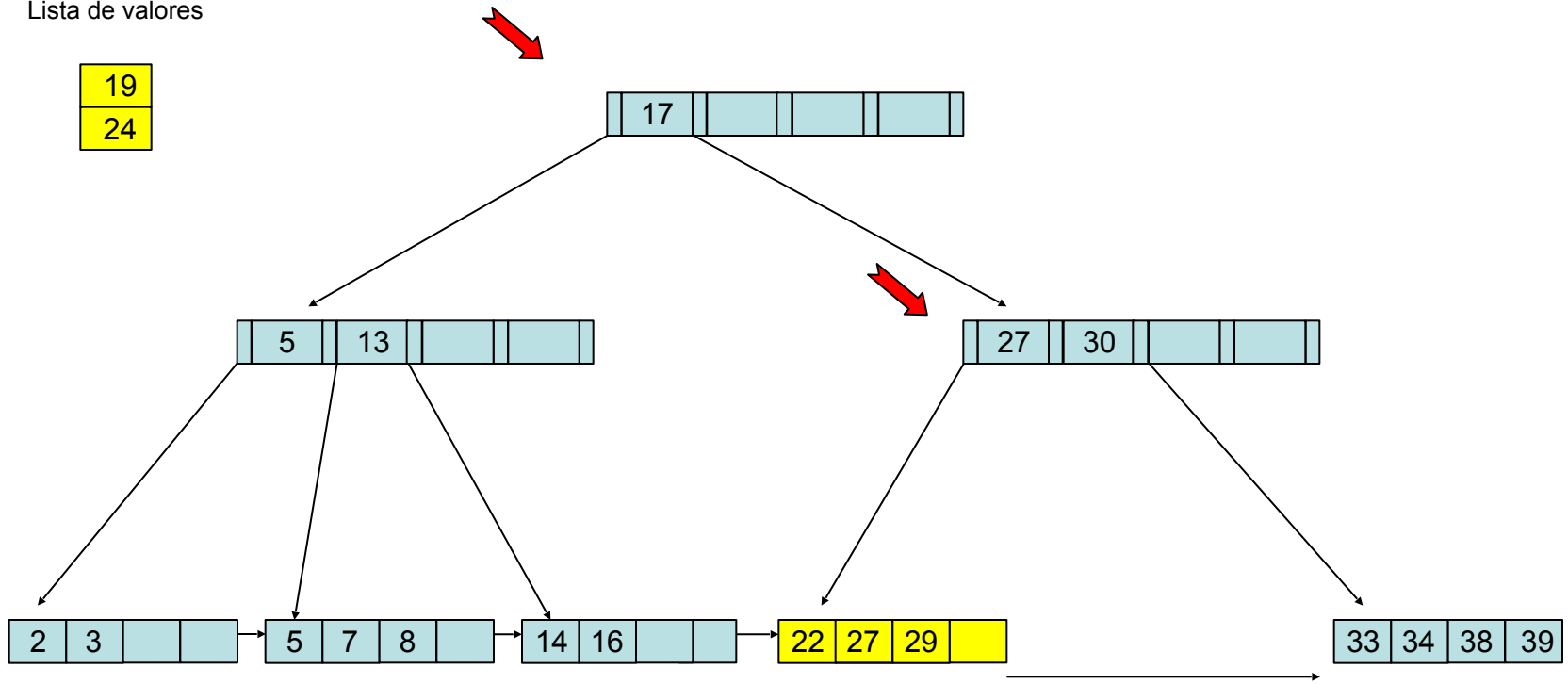
Lista de valores

19
24



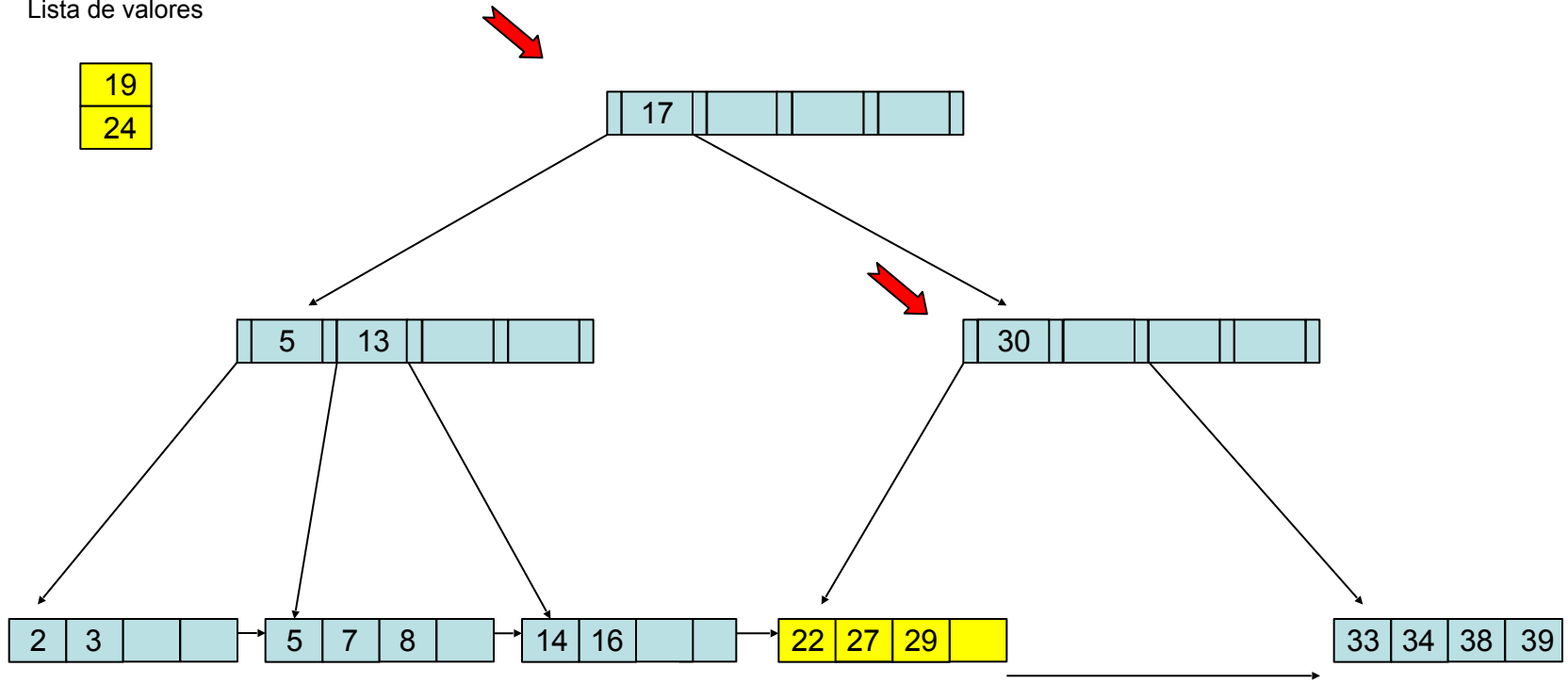
Lista de valores

19
24



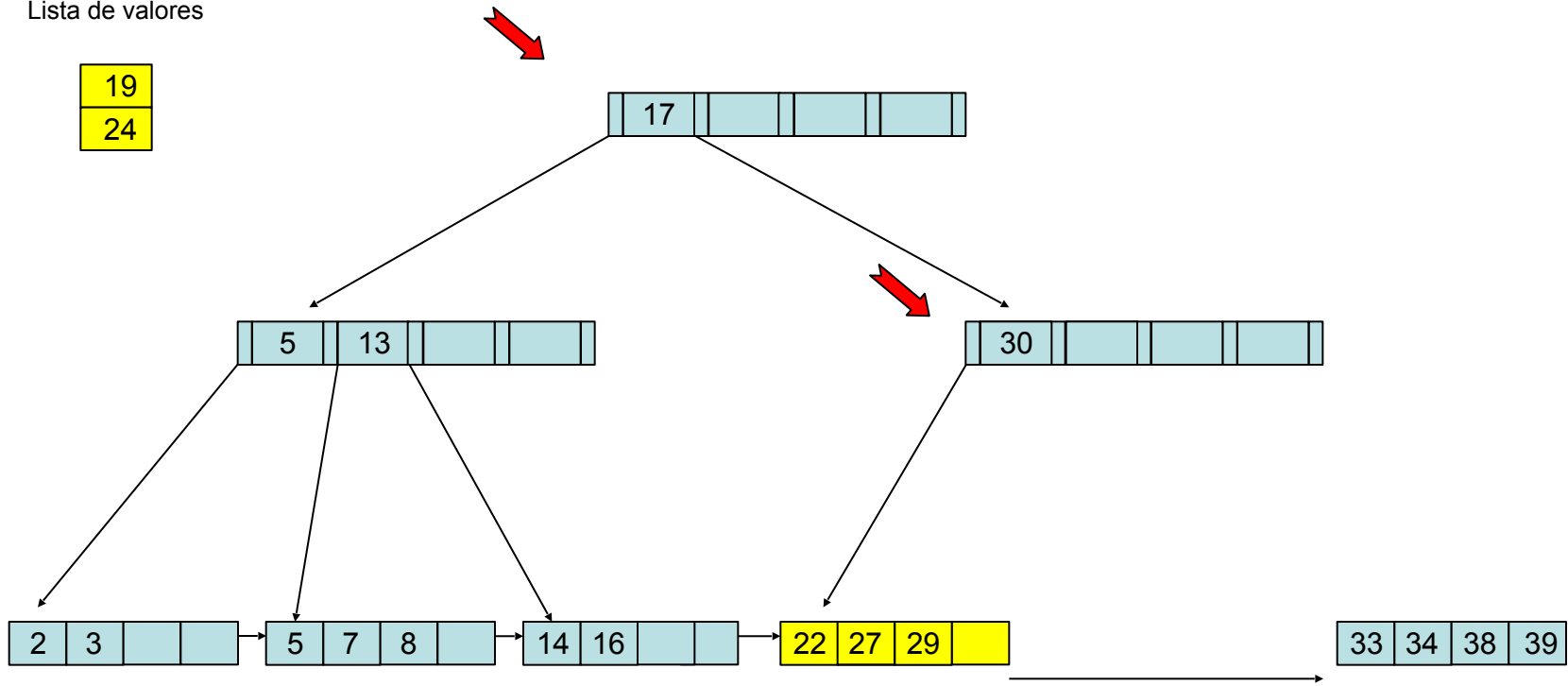
Lista de valores

19
24



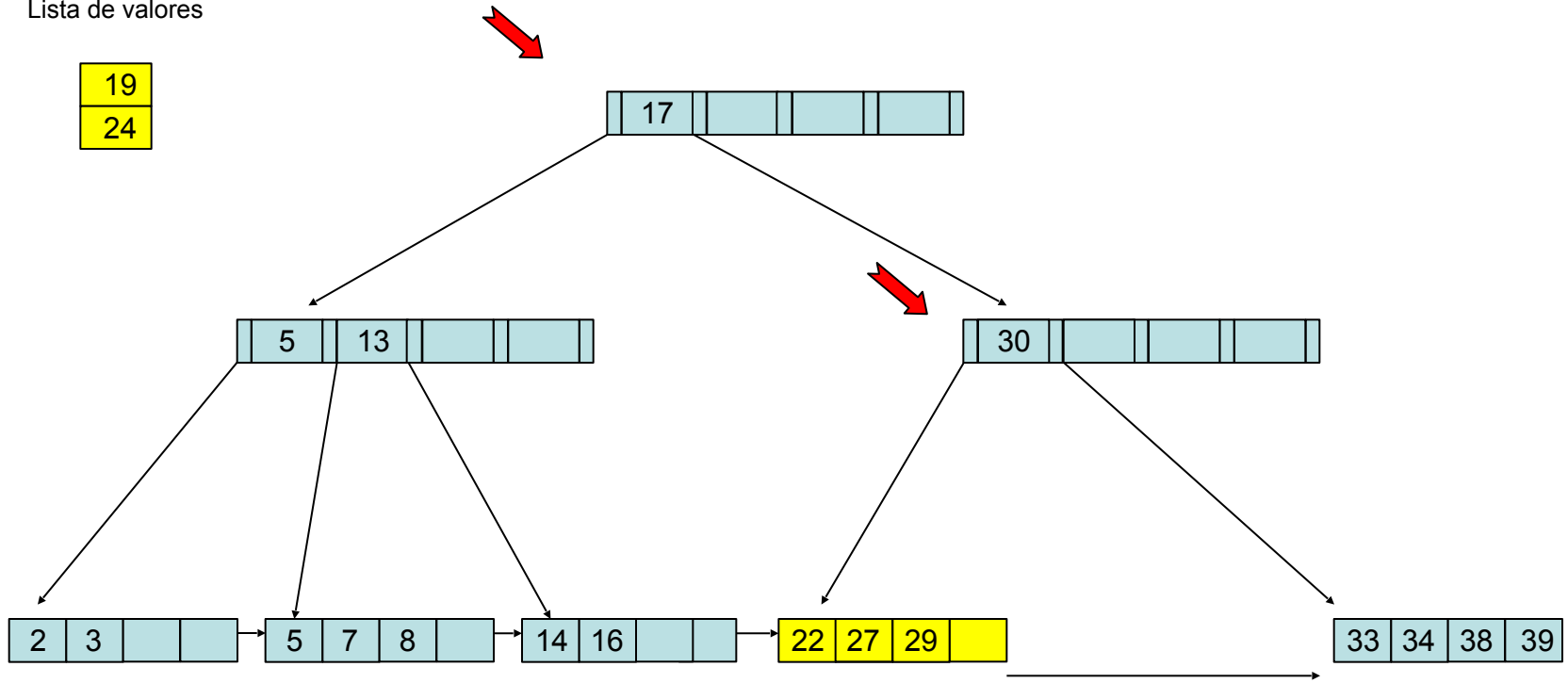
Lista de valores

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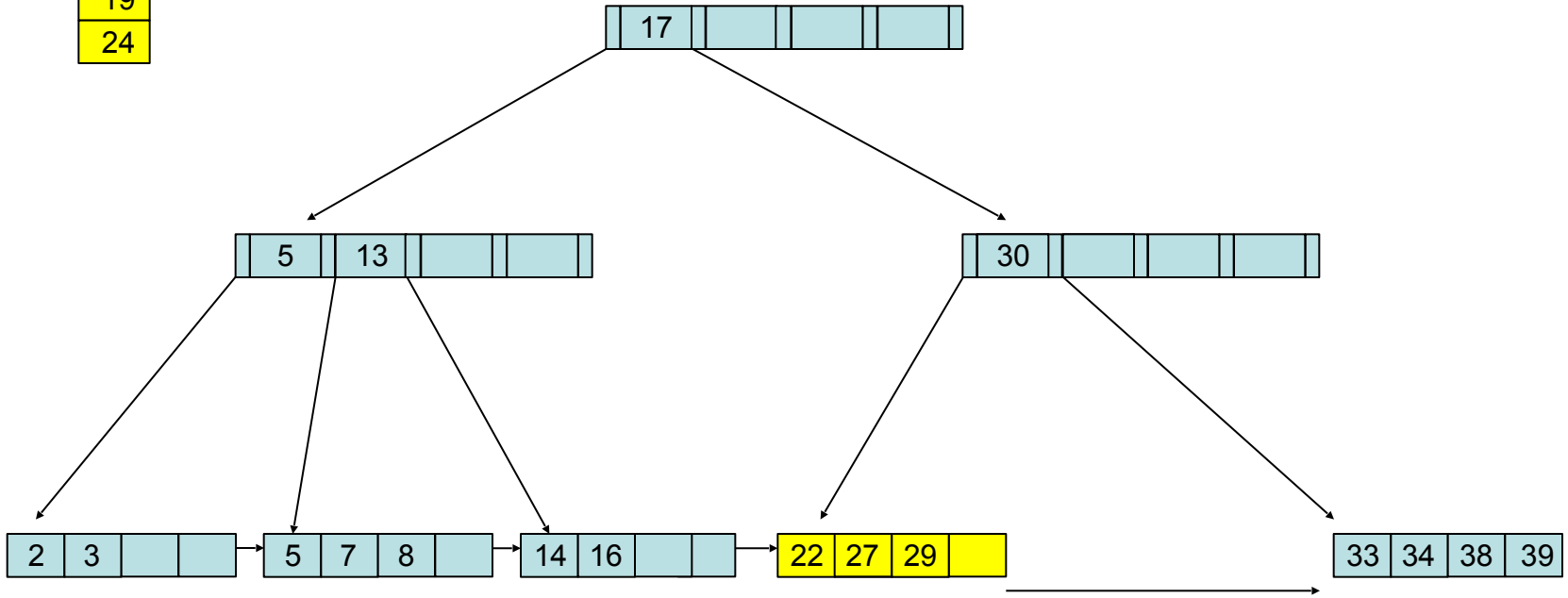
Lista de valores

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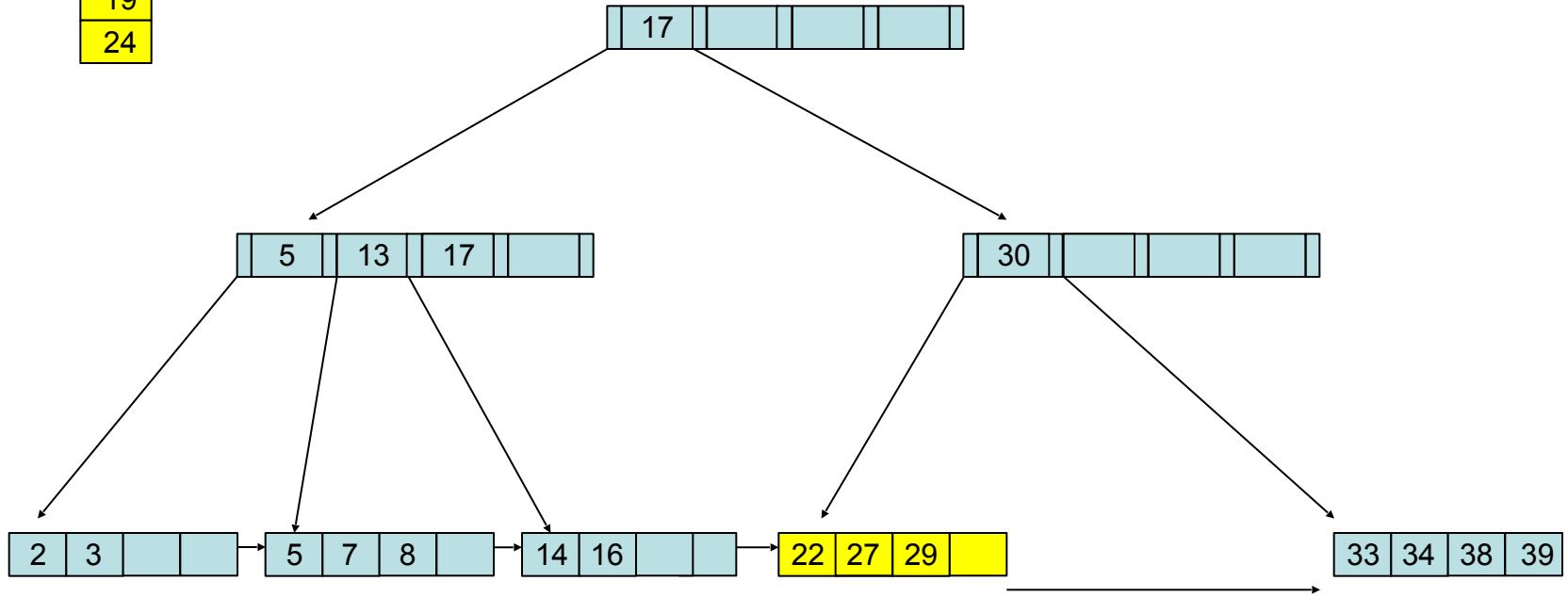
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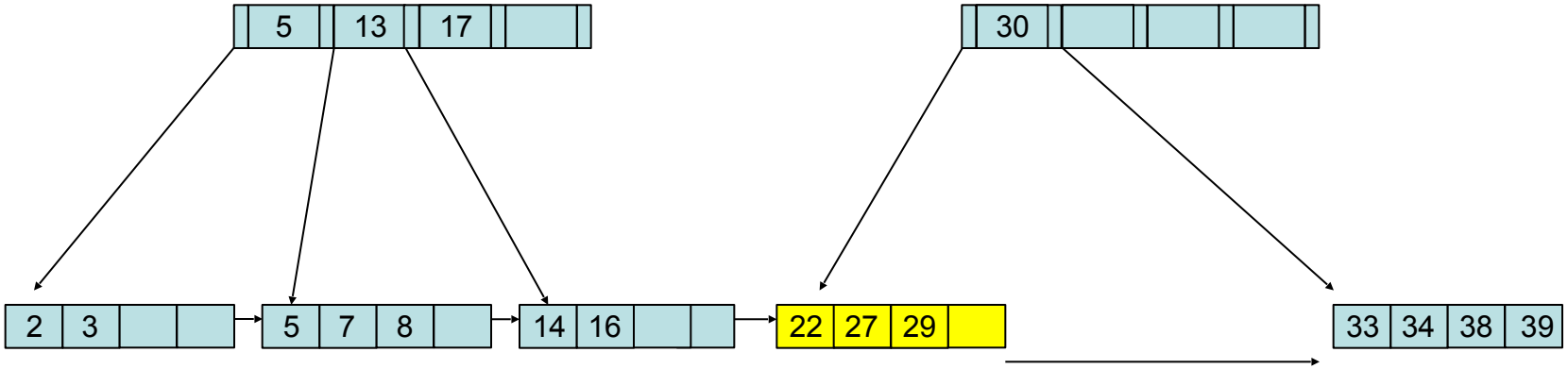
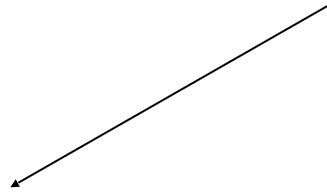
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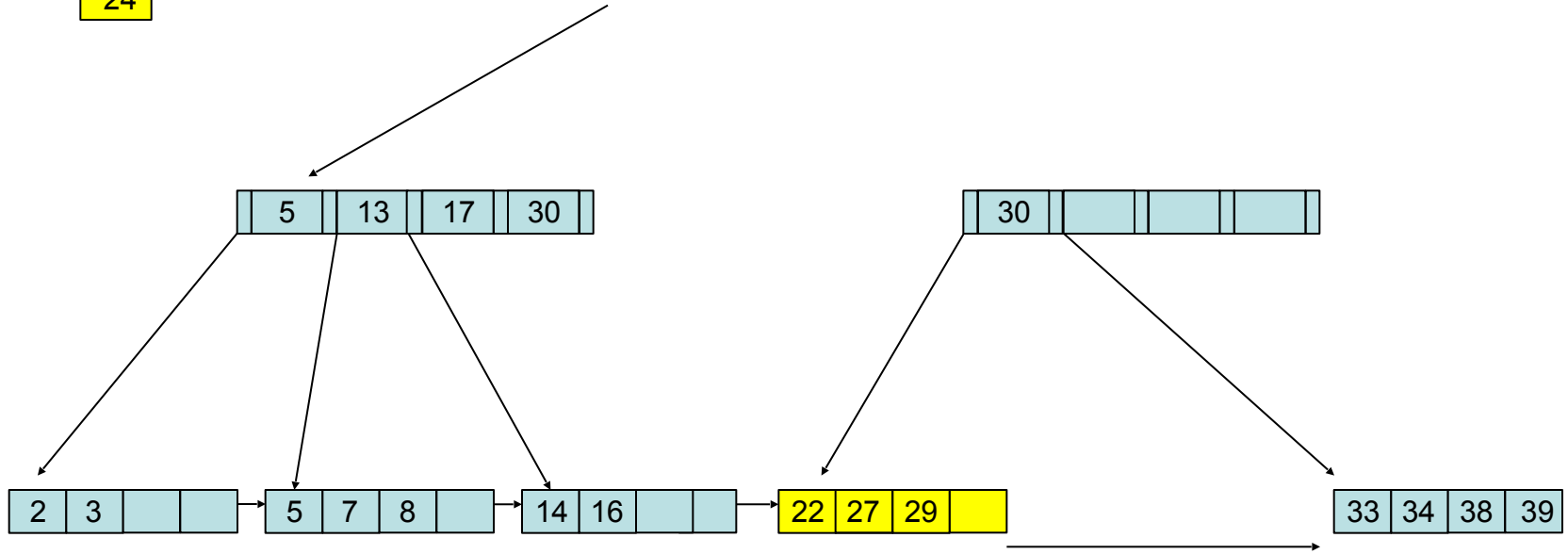
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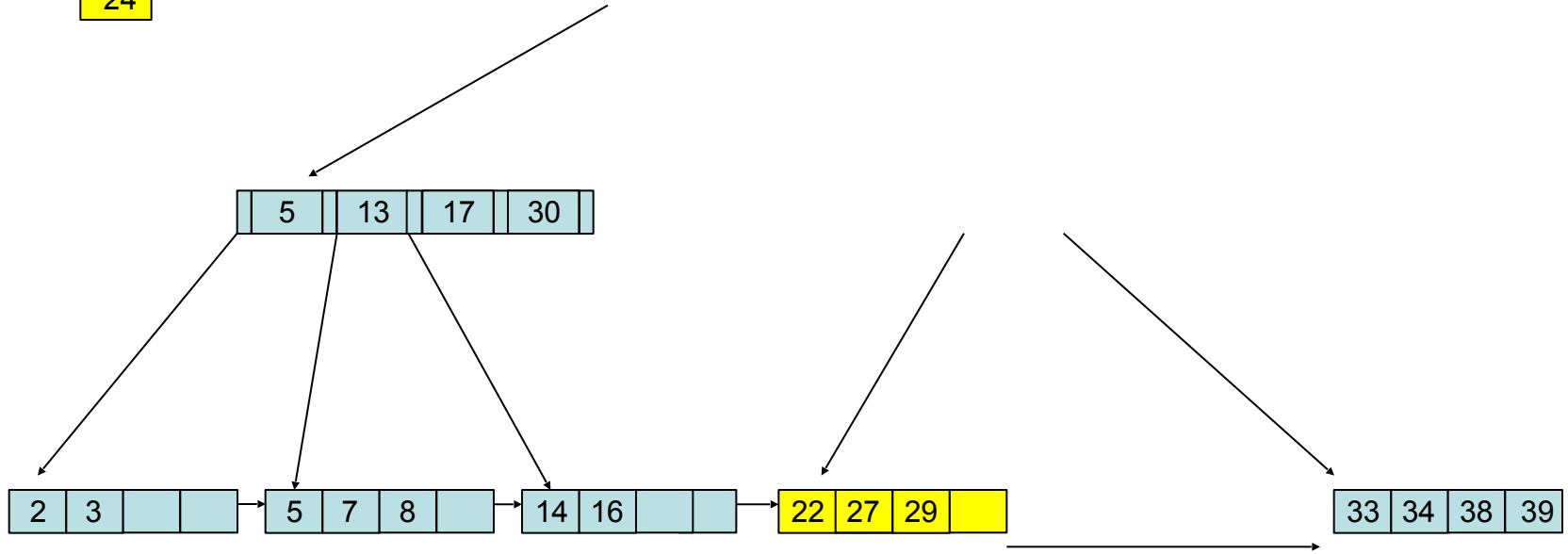
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Lista de valores

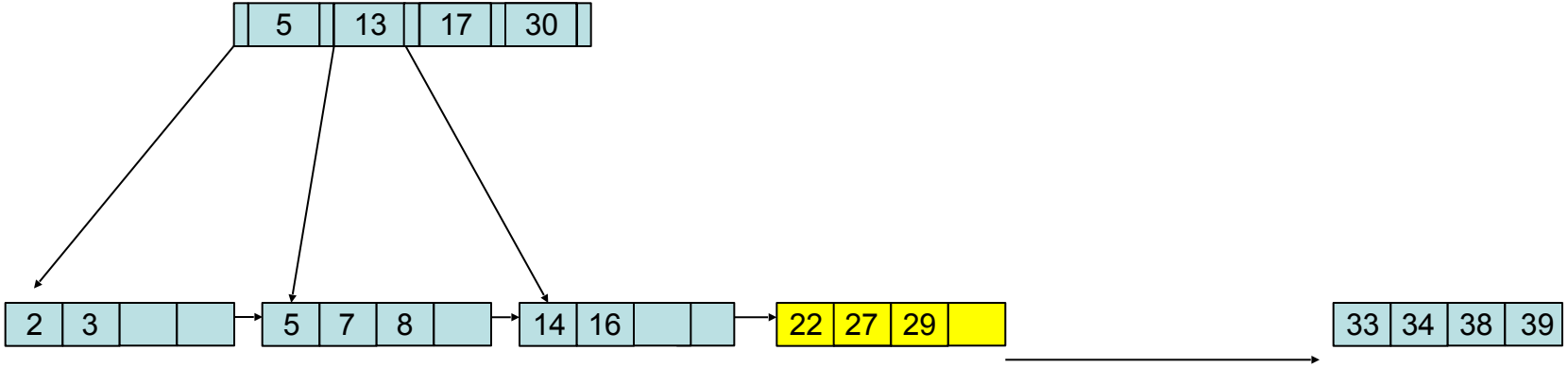
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Lista de valores

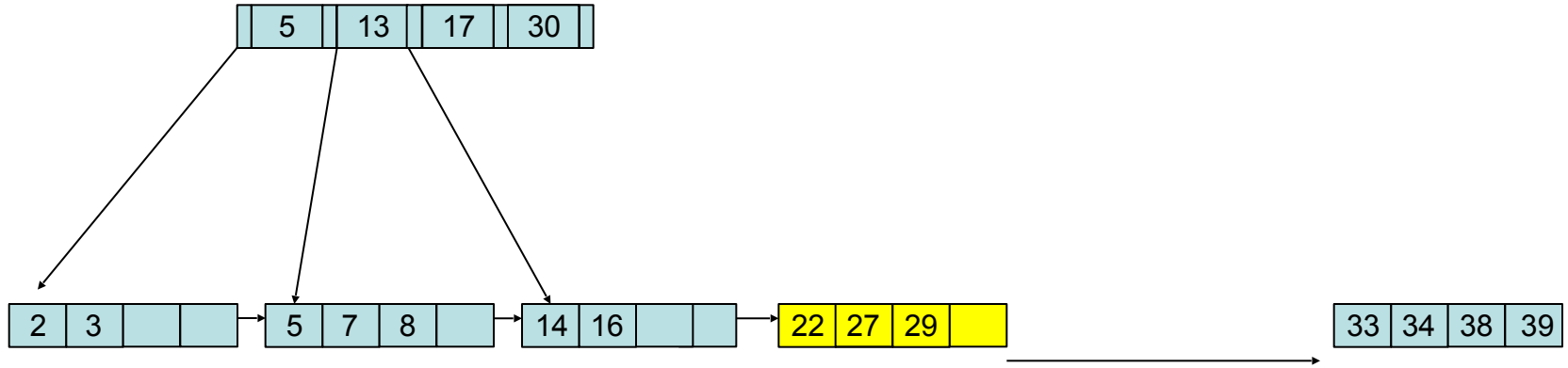


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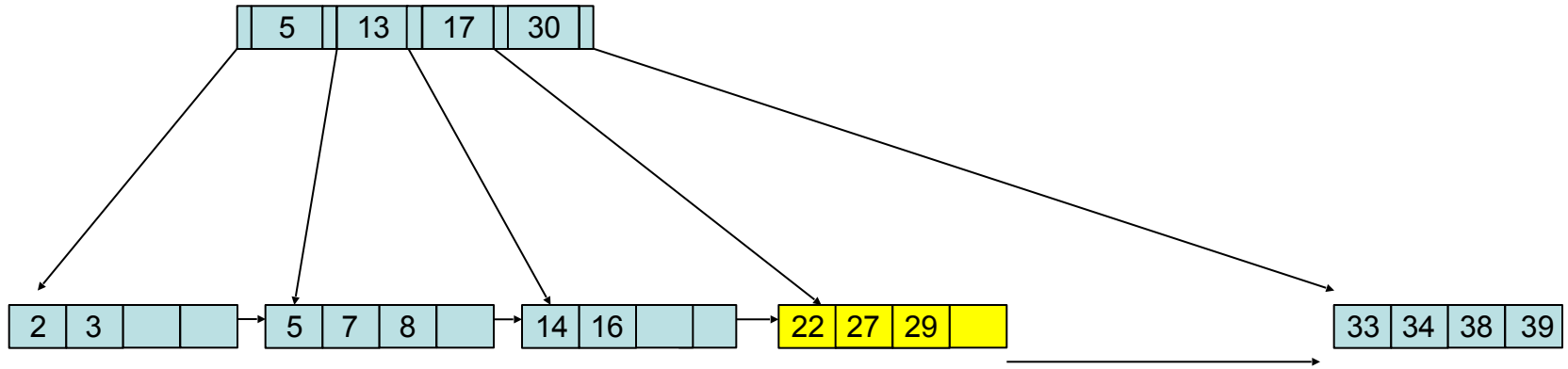
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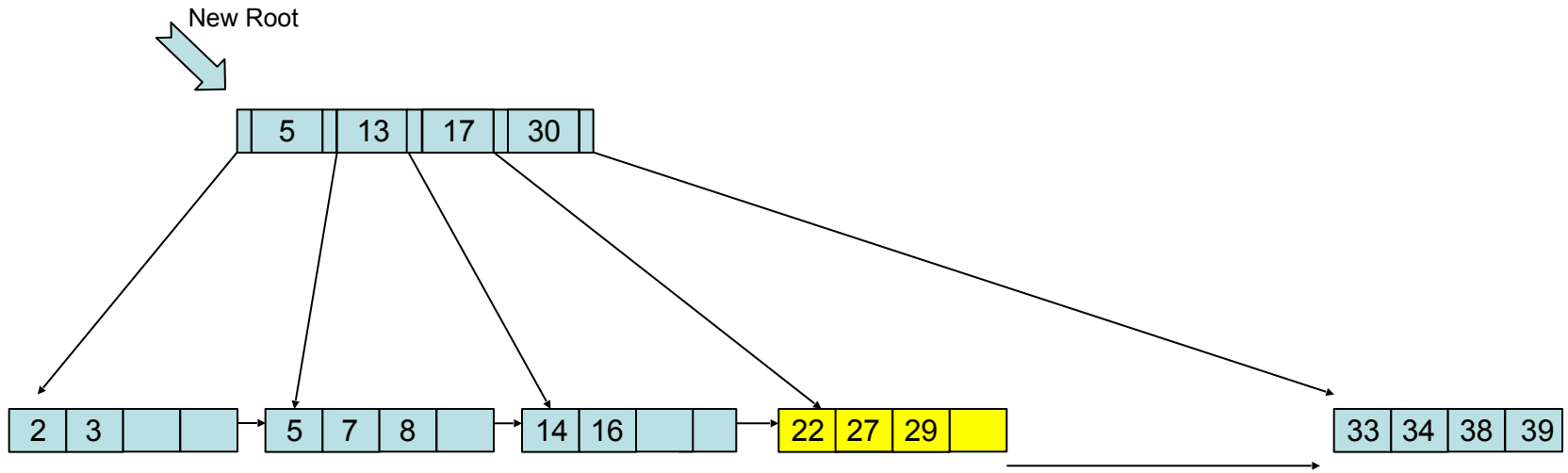
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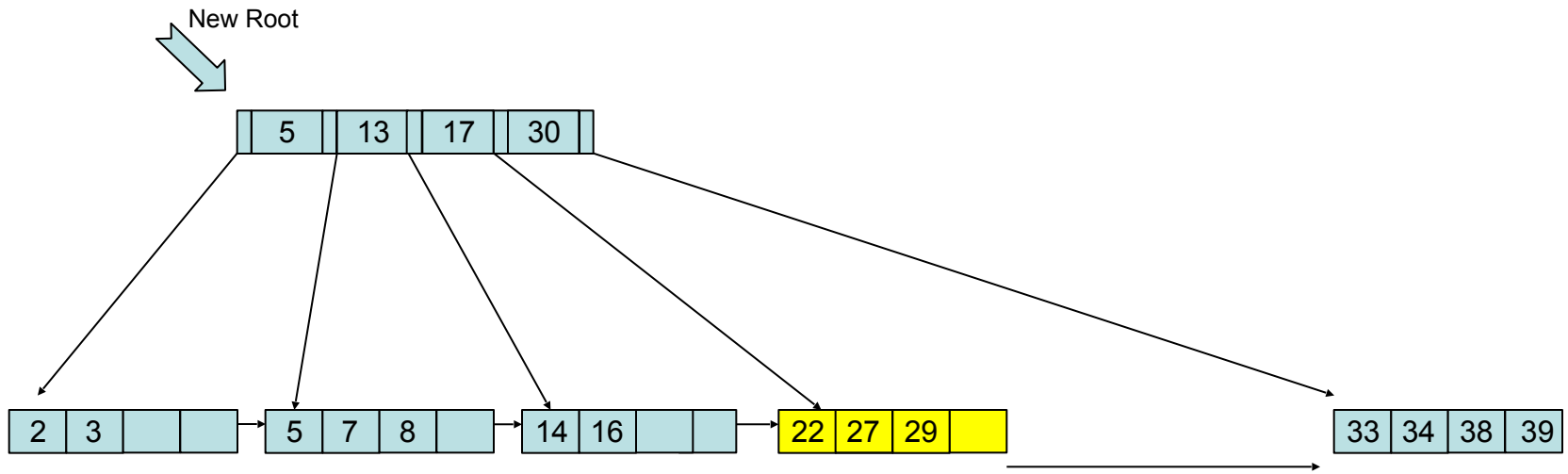
Lista de valores

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Lista de valores

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