ePAL - B+ and 2-3-4 Trees

Radek Mařík
Marko Genyk-Berezovskyj

ČVUT FEL, K13133

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Outline

1. Red-Black Tree
2. 2-3-4 Tree
3. B Tree
4. B+ Tree

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Example 1

To an initially empty red-black tree insert sequentially keys $10, 85, 15, 70, 20, 60, 30, 50, 65, 80, 90, 40, 5, 55$.

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1 Red-Black Tree

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Example 2

To an initially empty 2-3-4 tree insert sequentially keys $2, 15, 12, 4, 8, 10, 25, 35, 55, 11, 9, 5, 7$.

Example 3

To an initially empty 2-3-4 tree insert sequentially keys $A, S, E, R, C, H, I, N, G, X$.

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Example 4

To an initially empty B tree of order 5 insert sequentially keys $C, N, G, A, H, E, K, Q, M, F, W, L, T, Z, D, P, R, X, Y, S$.

Example 5

From an initially empty B tree of order 5 with sequentially inserted keys $C, N, G, A, H, E, K, Q, M, F, W, L, T, Z, D, P, R, X, Y, S$ (the previous example) delete sequentially keys H, T, S.

Outline

1 Red-Black Tree

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3 B Tree

4 B+ Tree

Example 6

To an initially empty B+ tree of order 4 insert sequentially keys $1, 4, 16, 25, 9, 20, 13, 15, 10, 11, 12$.

Example 7

From an initially empty B+ tree of order 4 with sequentially inserted keys $1, 4, 16, 25, 9, 20, 13, 15, 10, 11, 12$ (the previous example) delete sequentially keys $13, 15, 1$.

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