ePAL - Approximate Text Searching

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Outline

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Example 1

A splay tree contains seven keys $1, 2, ..., 7$ and is ideally balanced, that is, its depth is 2. After searching for a element with the key 1, the element moves to the root of the tree. What will the depth of the resulting tree be?

Example 2

A splay tree contains seven keys $1, 2, ..., 7$ and is ideally balanced, that is, its depth is 2. After searching for a element with the key 2, the element moves to the root of the tree. What will the depth of the resulting tree be?

Example 3

A splay tree contains seven keys $1, 2, ..., 7$ and is ideally balanced, that is, its depth is 2. After searching for a element with the key 3, the element moves to the root of the tree. What will the depth of the resulting tree be?

Example 4

Suppose a perfectly balanced splay tree having depth $h > 0$. After an access to the element with the smallest key in the tree, the tree will be changed and its depth is increased. What is the new depth of the tree? Solve separately for odd and even h

Example 5

To an initially empty splay tree load sequentially keys $2, 7, 1, 4, 3, 9, 5, 6$.
Draw the tree after each insertion.

Outline

Example 6

Trees over a given set of n keys:

1. AVL tree is always ideally balanced
2. RB tree has the same depth all the leaves that contain keys
3. AVL tree with n nodes is balanced using $\log_2(n)$ of rotations in the worst case.
4. RB tree with only black nodes is a regular.

Example 7

Red-black tree

1. has a maximum height equal to 2/3 of its height black.
2. has red leaves.
3. successors of a red node are always black and they are three
4. maintains all branches of the same black height.

Example 8

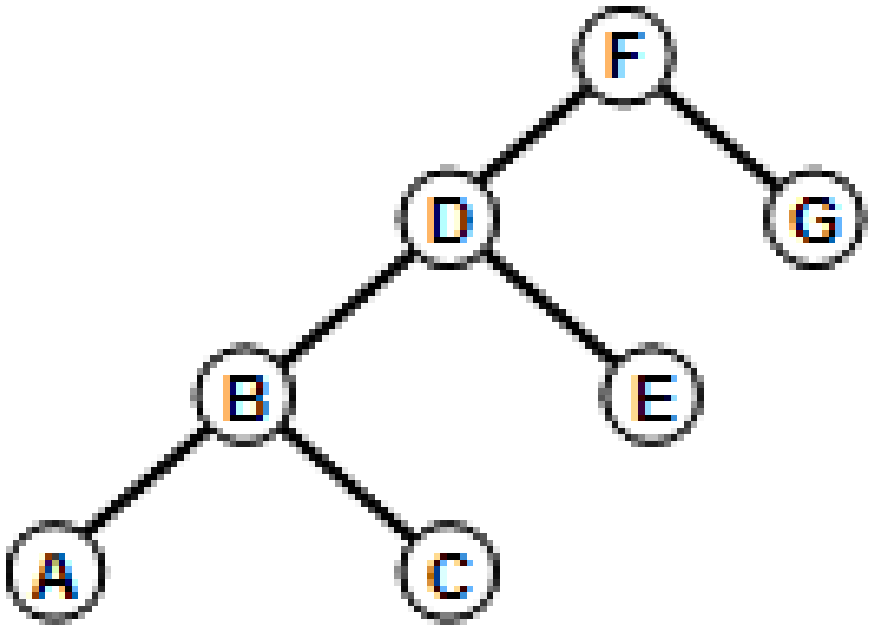
Red-black tree

1. has a maximum height equal to twice the height of his black height.
2. has the same number of nodes in all branches.
3. has three types of nodes: black, red and white.
4. successors of a black node are always red.

Example 9

To get an RB-tree with black height 2, we color the nodes as follows:

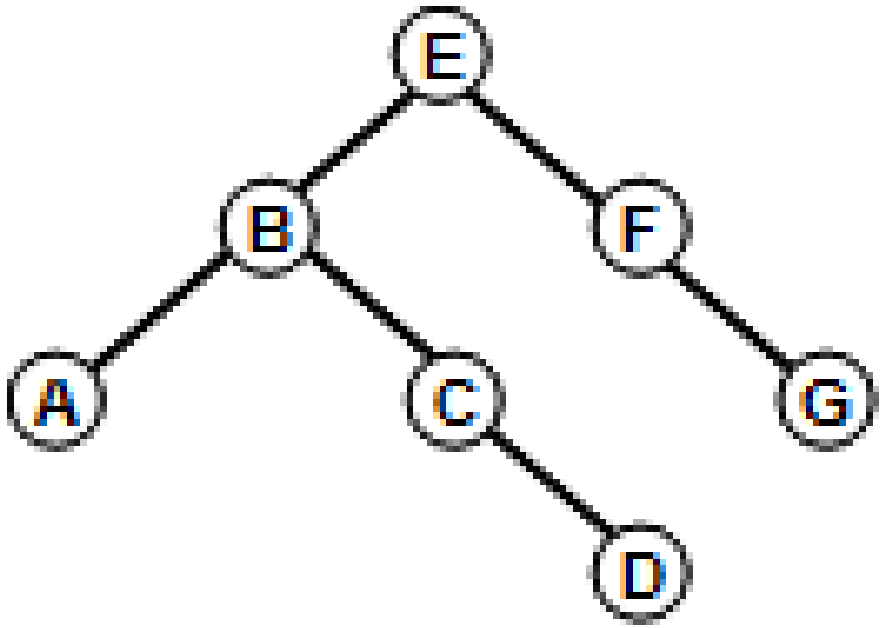
1. A, C, G, red and other black
2. B, D, G, red and other black
3. A, C, D, red and other black
4. B, F, D, the other red and black



Example 10

To get an RB-tree with black height 2, we color the nodes as follows:

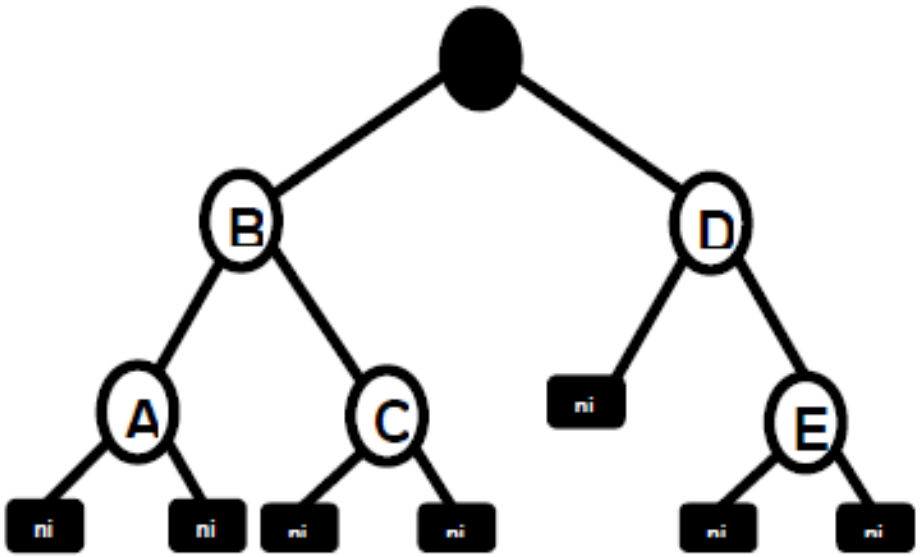
1. A, C, D, G, red and other black
2. B, D, G, red and other black
3. B, F, D, the other red and black
4. A, C, G, red and other black



Example 11

Red-black tree is an often used structure. What colors have marked nodes of the tree in the picture so that it is really a red-black tree?

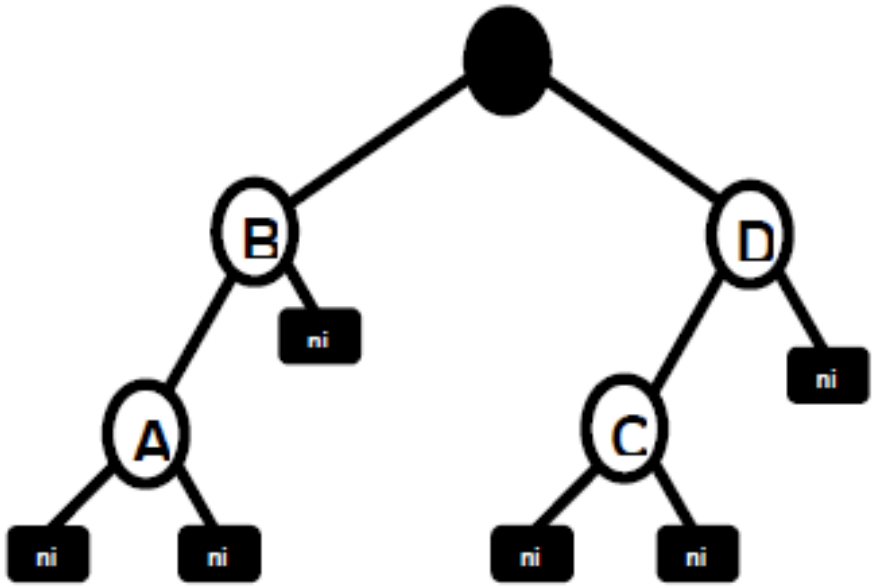
1. A red, red B, C Black, D Black, E Black
2. A black, red B, C Black, D Black, E Black
3. A red, black B, C red, D Black, E red
4. A black, B red, C black, red D, E Black



Example 12

Red-black tree is an often used structure. What colors have marked nodes of the tree in the picture so that it is really a red-black tree?

1. A red, red B, C Black, Black D
2. A red, black B, C red, D Black
3. A black, red B, C Black, Black D
4. A black, B red, C black, red D



References I