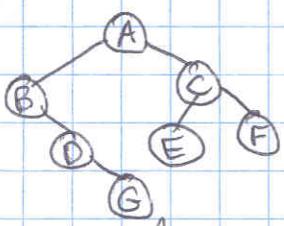
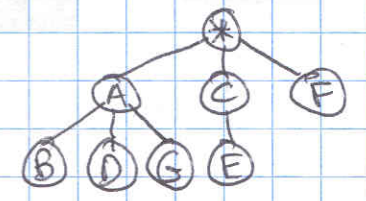
Transformations [Munro & Raman – FOCS (1997)]

6.897
L12.3
Apr. 7, 2003

- more powerful succinct binary trie representation:

binary trie	rooted ordered tree	balanced parentheses
		((( ) ( ) ( )) (( )) ( )) * A B B D D G G A C E E C F F *
node	node	left. paren. (say)
left-child	first-child (if any)	next-character if (
right-child	next-sibling	character after matching)
parent	{ prev-sibling or else parent	{ prev. char.) ⇒ matching (prev. char. (⇒ that.
subtree-size	size(node) + sizes of rightward siblings	distance from (to enclosing) / 2
lca	a child of lca → common enclosing paren pair	

- Munro & Raman — all O(1) time except lca
- Benoit, Demaine, Munro, Raman [WADS 1998]
  - better rooted ordered tree – ith child in O(1).
  - all O(1) time
- from subtree size, can compute index of external node (i.e. index into suffix array)