CS/ENGRI 172, Fall 2002
9/6/02: Lecture Four Handout

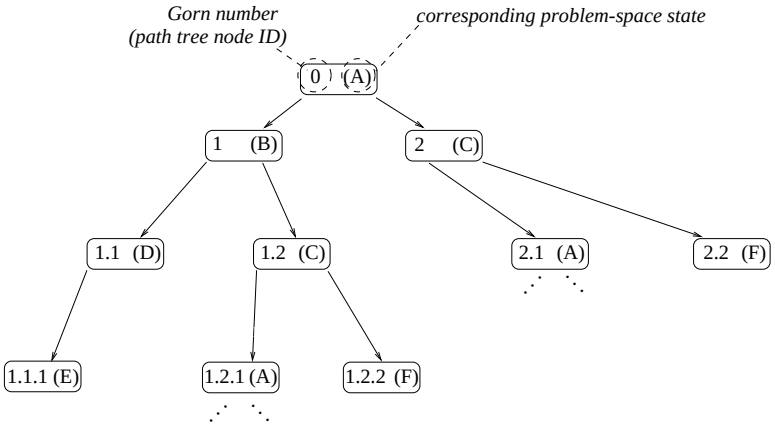
Topics: Problem spaces and problem solving.

Example problem space

The states are A, B, C, D, E, F, R, and S, with A being the initial state. For the purposes of this example only, we leave the goal state unspecified. The operators are as follows:

α_1: A $\rightarrow$B γ_1: C $\rightarrow$A
α_2: A $\rightarrow$C γ_2: C $\rightarrow$F
β_1: B $\rightarrow$D δ_1: D $\rightarrow$E
β_2: B $\rightarrow$C ρ_1: R $\rightarrow$S

Path tree (goal states not indicated, operator labels omitted):



Depth-first search:	*Breadth-first search*:
1. Mark node 0 visited.	1. Mark node 0 touched.
2. Choose the deepest visited node n.	2. Choose the largest-Gorn-numbered touched node n.
(a) If n corresponds to a problem-space goal state, declare success and **stop**;	(a) If n corresponds to a problem-space goal state, declare success and **stop**;
(b) otherwise, if n corresponds to a repeated problem-space state or is childless, remove it and all its descendants;	(b) otherwise, if n corresponds to a repeated problem-space state or is childless, delete it and all its descendants;
(c) otherwise, mark n's least-Gorn-numbered unvisited child as visited.	(c) otherwise, mark the least-Gorn-numbered untouched node as touched.
3. If the tree still has nodes, repeat step 2.	3. If the tree still has nodes, repeat step 2.
4. If the entire tree has been removed, declare failure.	4. If the entire tree has been deleted, declare failure.

Note: we're using "visited" and "removed" for DFS and "touched" and "deleted" for BFS to facilitate lecture notation.