CAP4630.01 Assignment 3: Due 10/3/2019

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October 3, 2019

Given the following search tree, state the order in which the nodes will be visited by using **hill climbing, steepest ascent hill climbing, depth-first iterative deepening** and **beam search with width** = 3. The numbers on the nodes indicate the estimated cost to the goal.

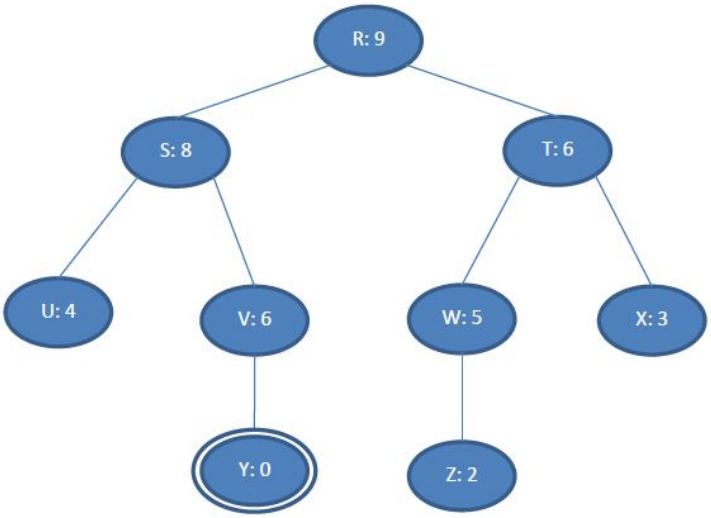

Figure 1: Search tree

Hill climbing: R:9, S:8, U:4.
R has distance of 9, first child of R with lower distance is S:8.
First child of S with lower distance is U:4.
U has no children, goal node not found.

Steepest ascent hill climbing: R:9, T:6, X:3.
Same as **Hill climbing** except that it will always take the best of the child nodes no matter the node expansion. Goal node not reached.

Depth-first iterative deepening: R:9, R:9, S:8, T:6, R:9, S:8, U:4, V:6, T:6, W:5, X:,3 R:9, S:8, U:4, V:6, Y:0.
Do depth-limited search for depths $= 0 \rightarrow 3$ until goal node is reached.
DLS depth $= 0$: R
DLS depth $= 1$: R, S, T
DLS depth $= 2$: R, S, U, V, T, W, X
DLS depth $= 3$: R, S, U, V, Y

Beam search, width $= 3$: R:9, T:6, X:3, W:5, Z:2, S:8, U:4, V:6, Y:0.
Search node R, add children to queue and sort, T:6, S:8.
Search T:6, add children to queue, X:3, W:5, S:8 search X:3, no goal state.
Search W:5, add children to queue, Z:2, S:8, search Z:2, no goal state.
Search S:8, add children to queue, U:4, V:6, search U:4, no goal state.
Search V:6, add children to queue, Y:0, search Y:0, goal state found.