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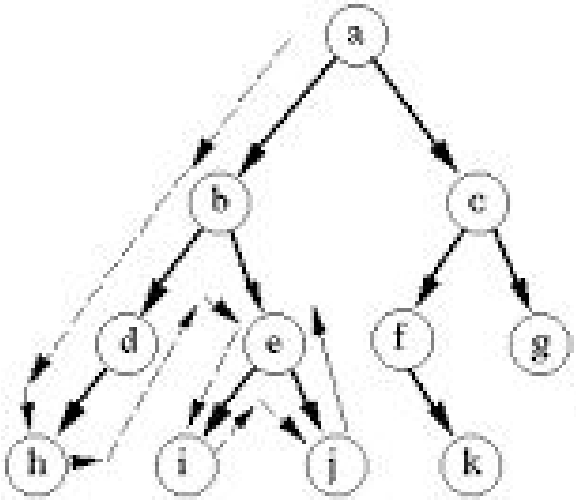
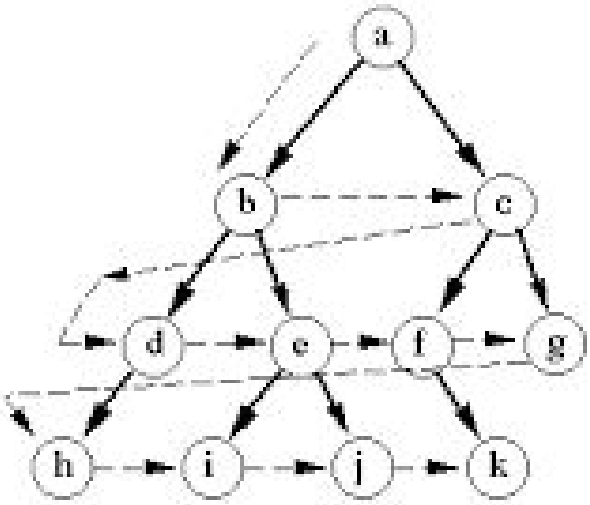
Report 9

1. Which heuristics did you use for the A* algorithm?
    a. Consistent: Number of miss-placed crates on the stacks.
    b. Inconsistent: Constant number 2. It is admissible because it always underestimates the cost, but it is not consisten because 2*2*2*2 is not equal to 2.
2. Which of the four algorithms searches the least nodes and which one take the most?
    a. A* produced the least number of nodes
    b. BFS and DFS produced a larger number of nodes to find a solution
3. Why does this happen?
    a. Because if the heuristic is admissible it goes to the node with the lowest estimated cost and like BFS it will always find a solution if there is one.
    b. Because in the worst scenario they go through all the nodes and try them to expand to reach the answer .
    c. DFS has the probability of getting cycle if it does not has a visited list
4. Which algorithms are optimal? Why?
    a. A* : Yes , because it is always checking for the best answer by comparing each node , even with an inconsistent heuristic
        i. Given different heuristics it could find the answer more quickly than the other one.
    b. DFS: Not optimal, because there is nothing that guarantees that it will always find the best path. It can only be optimal if the tree is finite, all the actions cost the same and every path has the same length.
    c. BFS : Not optimal, unless it has a different costs in every path , also there is no guarantee that the solution it finds is the best solution.
5. In your opinion what are the benefits of simpler algorithms versus more complex ones?
    a. We think that simpler algorithms have more benefits if you have to use them with a small set of data , because are easier to program and given this fact it takes less time in comparison with the complex ones.

Examples of representations:

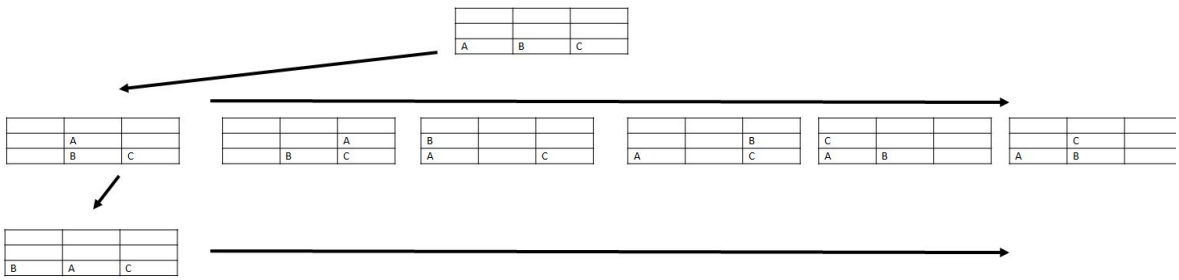


Depth-first search

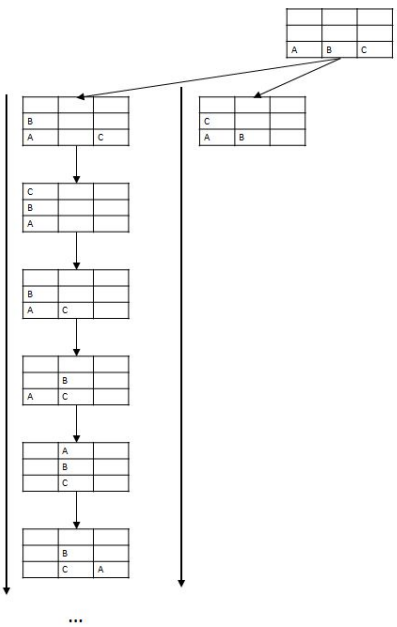


Breadth-first search

BFS



DFS



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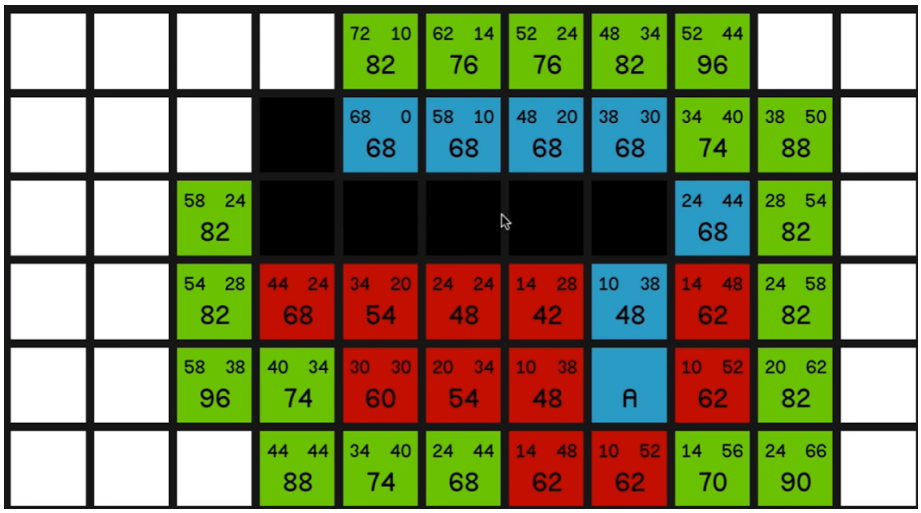
A*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