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(I) Implement the following algorithms:

(i) Iterative deepening search algorithm

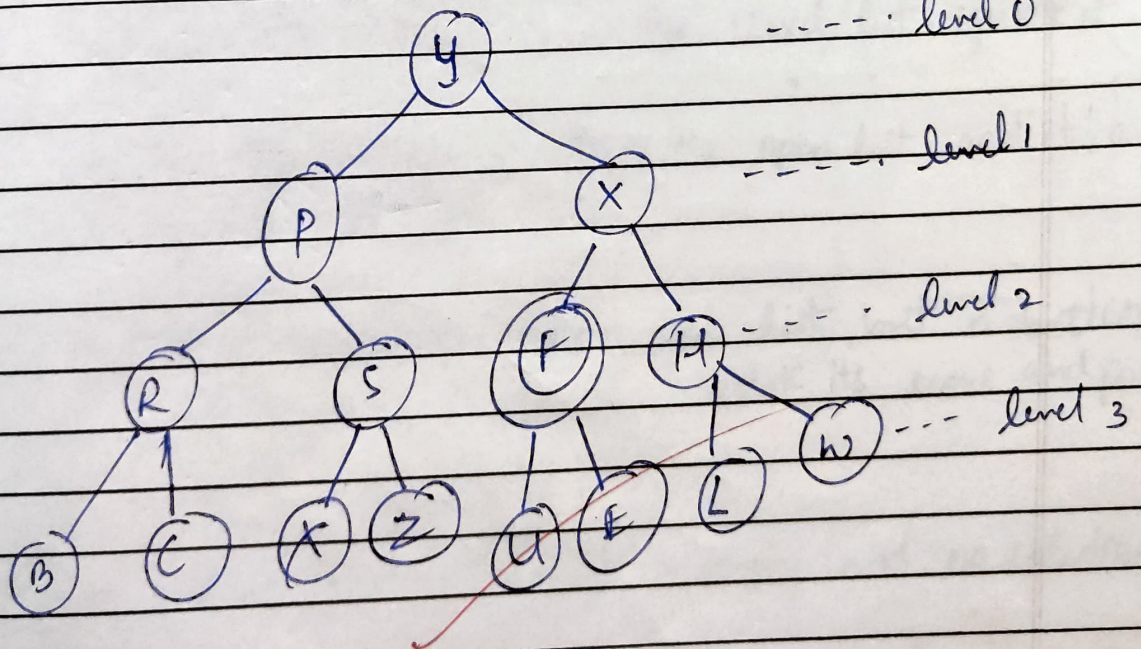
(1) Initialize with depth limit = 0

(2) Perform Depth first search algorithm upto the current depth limit.

(3) If a solution is found, return it.

(4) If no solution is found, increment the depth limit and repeat the DFS from the start.

(5) Continue until a solution is found or all depths are explored.



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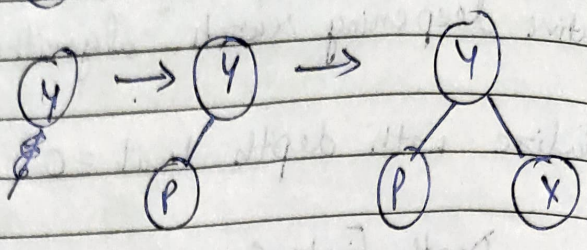
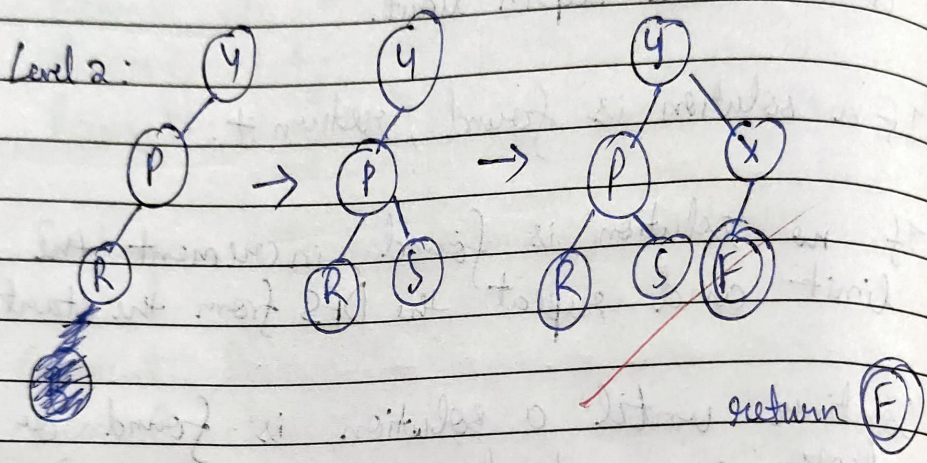
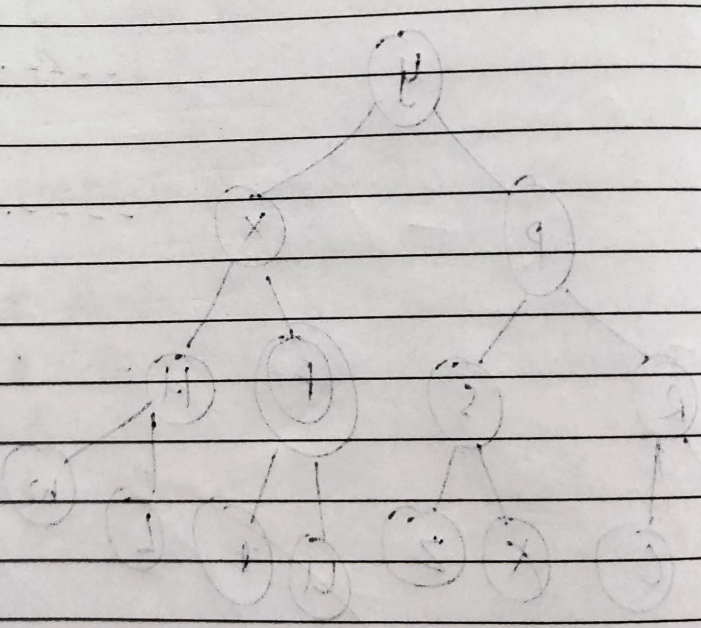
Level 0 :

Level 1 :



Level 2 :





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A* Algorithm:

here node → the possible grids

1. Initialize the open list (set of nodes to be evaluated) with the start node and the closed list (set of already evaluated nodes) as empty.

2. while the open list is not empty:
   ⇒ Select the node with the lowest f(n) value from open list.

   ⇒ If the selected node is the goal, reconstruct and return the path.

   ⇒ Otherwise, move it to the closed list.

   ⇒ for each neighbor of the current node:
   (1) If the neighbor is in the closed list, ignore it

   (2) If the neighbor is not in the open list, add it, and compute its f(n) score.

   (3) If the neighbor is in the open list but a better g(n) value is found, update its score and parent.

3. Return failure if the open list is empty and no solution is found.

Implemented 15/10/24

Goal state

2	8	1
	4	3
7	6	5

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Initial State

1	2	3
8		4
7	6	5

$g(n) = 0$ (no of moves)

(8)

1		3
8	2	4
7	6	5

$f(n) = 1 + md$

1	2	3
	8	4
7	6	5

$f(n) = 1 + md$ ×

1	2	3
8	6	4
7		5

$f(n) = 1 + md$ ×

1	2	3
8	4	
7	6	5

$f(n) = 1 + md$ ×

$f(n) = g(n) + md$

	1	3
8	2	4
7	6	5

$f(n) = 2 + md$

1	3	
8	2	4
7	6	5

$f(n) = 2 + md$

Sneha SB

1 5 10 24