15th October, 2024. Tuesday Laboratory - 4

4) Implement the following algorithms:

(i) Iterative deepening search algorithm

(ii) A*

Algorithms:

Iterative Deepening Search algorithm / Iterative Deepening Depth first search Algorithm:

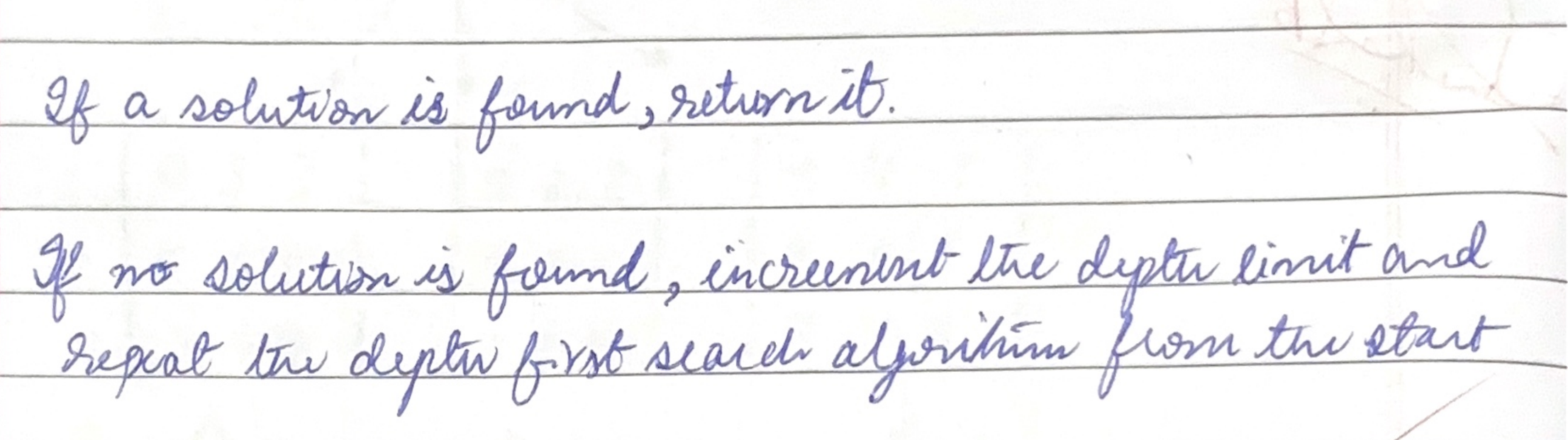
Step 1: Initialize with depth limit = 0

Step 2: Perform Depth First Search algorithm upto the current level / depth limit.

Step 3: If a solution is found, return it.

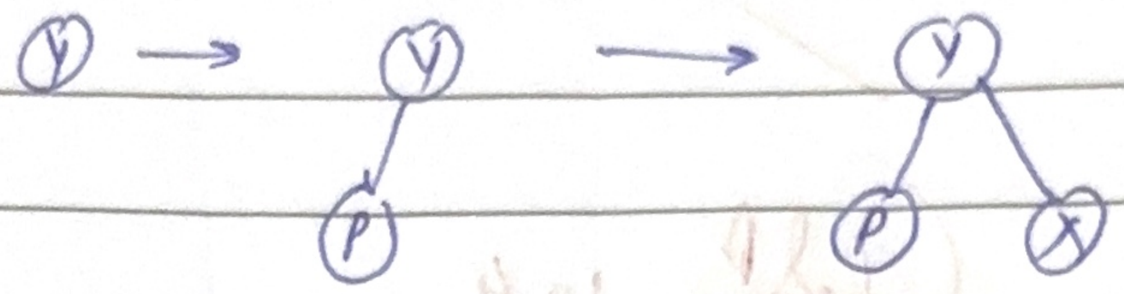
Step 4: If no solution is found, increment the depth limit and repeat the depth first seared algorithm from the start

Step 5: Continue until a solution is formed or all the levels are explored.

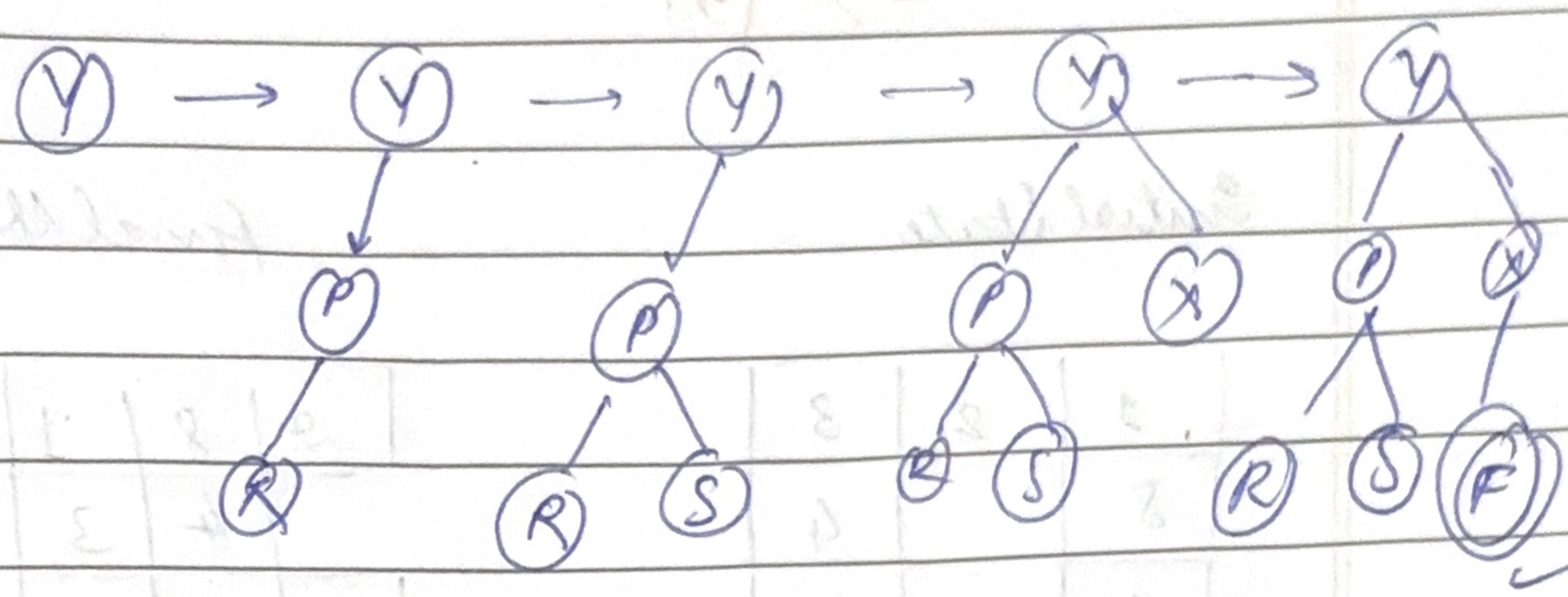


Level 0:


Level 1:




Level 2:




Found final state (F).

## A* Algorithm

Step 1: Initialize the open list: the set of all nodes to be evaluated
write the start node and closed list: set of already evaluated nodes as cr

Step 2 while ( open list != empty)

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- select the node with the lowest f(n) value from the open list
- If the selected node is goal, reconstruct and the path is returned
- else, move it to the closed list
- for every neighbour of the current node:
  - → If the neighbour is in the closed list, ignore it.
  - → If the neighbour is not in the open list, add it and compute its f(n) score
  - → If the neighbour is in the open list but a better g(n) value is found, update its score & parent