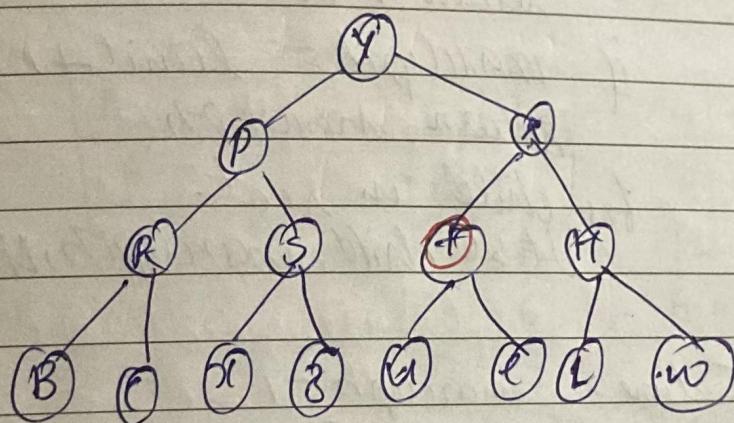


Write an algorithm and code for
Iterative deepening depth first search
and solve 8 puzzle A* algorithm.

\Rightarrow Iterative deepening DFS:



\rightarrow Iterative deepening dfs is a combination of DTS and BFS, it goes to each level and then does DFS from

Step 1: call the limit search function from range (1, max-size)

~~Step 2~~ * taking the goal & graph as input.

Step 2:

```
def IDDFS(graph, head):
    for maxdepth = 0 to limit:
        result = DFS (head, maxdepth).
    if result:
        return result.
    else
```

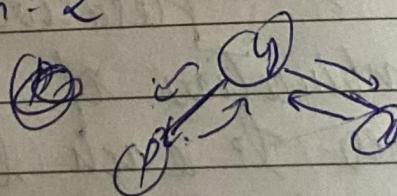
return 0
end if
end for

Step 3: DFS(head, maxdepth, limit):
if (head == leaf):
 return head:
if maxdepth == limit + 1
 return maxdepth.
for child in root:
 DFS(child, maxdepth, limit).

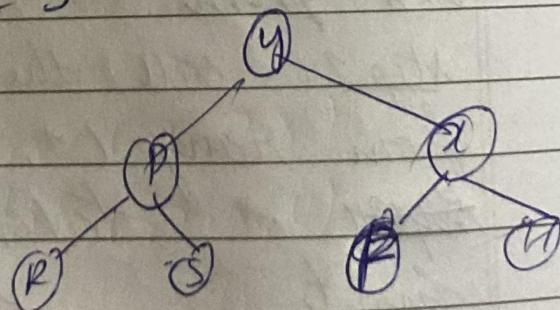
→ Iterations: maxdepth = 1

(Y)

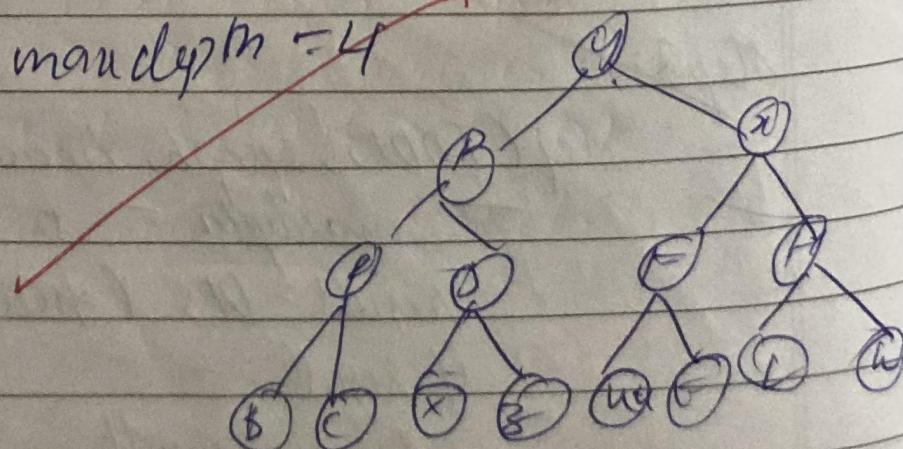
maxdepth = 2



maxdepth = 3



maxdepth = 4



Algorithm for 8 puzzle using A*.

Initial state

1	2	3
8		4
7	6	5

goal state

2	8	1
	4	3
7	6	5

1	3
8	2
7	6

$$h(n) = 8$$

$$f(n) = 9$$

1	2	3
8	4	
7	6	5

$$h(n) = 6$$

$$f(n) = 7$$

1	2	3
8	4	
7	6	5

$$h(n) = 6$$

$$f(n) = 7$$

1	2	3
8	6	4
7		5

$$h(n) = 8$$

$$f(n) = 9$$

1	2
8	4
7	6

$$h(n) = 7$$

$$f(n) = 9$$

1	2	3
8	4	
7	6	5

$$h(n) = 7$$

$$f(n) = 9$$

1	2	3
8	4	5
7	6	

$$h(n) = 7$$

$$f(n) = 9$$

1	2	3
8	4	5
7	6	

$$h(n) = 5$$

$$f(n) = 7$$

1	2	3
8	6	4
7	5	

$$h(n) = 7$$

$$f(n) = 9$$

1	2	3
8	8	4
7	6	5

$$h(n) = 7$$

$$f(n) = 9$$

1	2	3
8	4	3
7	6	5

$$h(n) = 6$$

$$f(n) = 9$$

1	2	3
8	1	4
7	6	5

$$h(n) = 6$$

$$f(n) = 9$$

```

def (startstate, goalstate):
    if i in range (1, no):
        cost = 0
        if startstate != goalstate.visited[1]:
            states[i] = generate (startstate)
        for i in states:
            cost += manhattan (state,
                                goalstate)
            min = min (min, cost)

```

visited.append (startstate)
 states (state, goalstate).

Drop
 15/10/21

output: for 1*

start = (1, 2, 3, 4, 5, 6, 0, 7, 8)
 goal = (1, 2, 3, 4, 5, 6, 7, 0, 8)

→ (1, 2, 3, 4, 5, 6, 0, 7, 8)
 (1, 2, 3, 4, 5, 6, 7, 0, 8)
 (1, 2, 3, 4, 5, 6, 7, 8, 0)



where

Date _____
Page _____

iteration 1:

$$A \rightarrow B \rightarrow C \rightarrow$$

iteration 2:

$$A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$$

target node E found