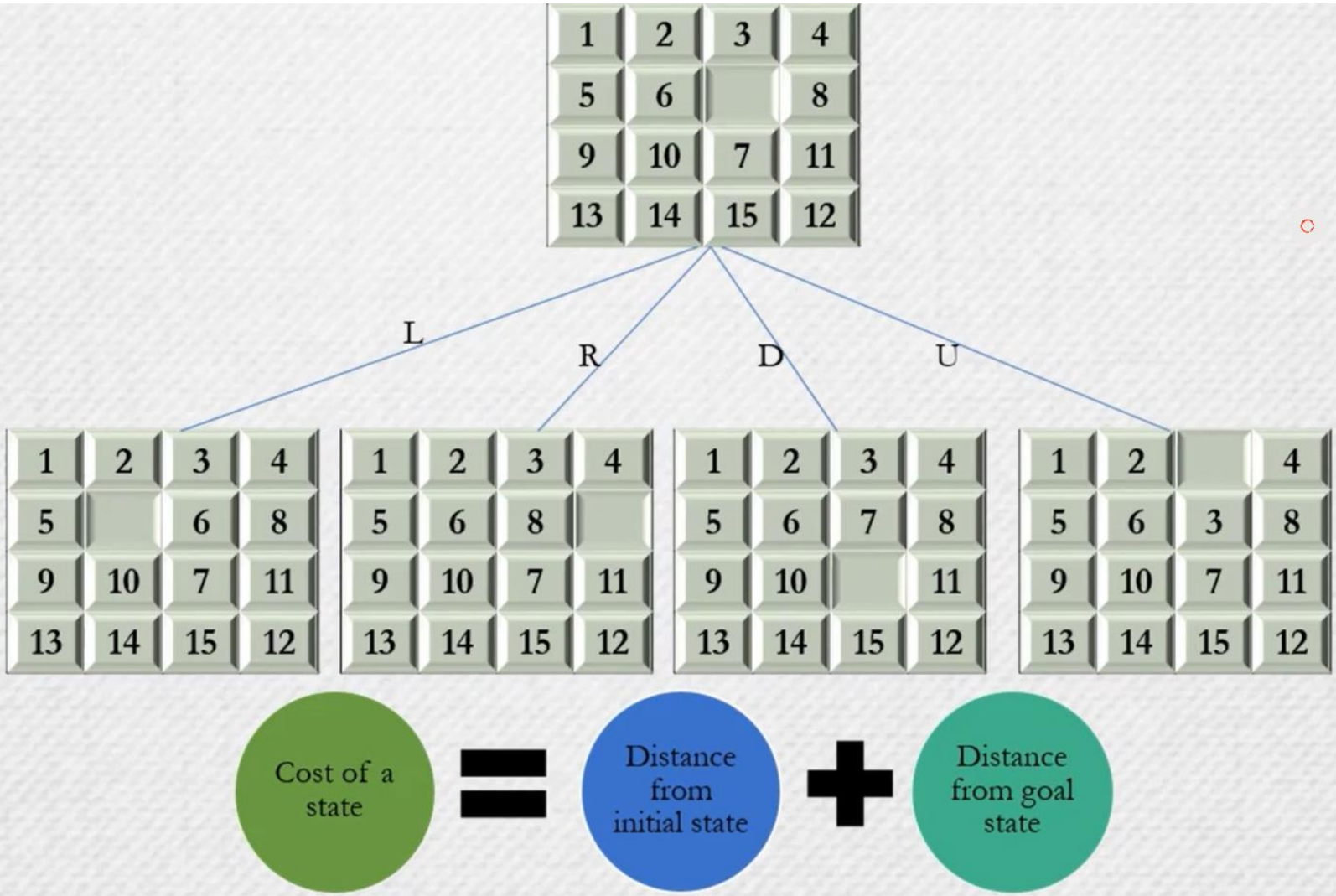
15-Puzzle game

Branch & Bound

Goal State

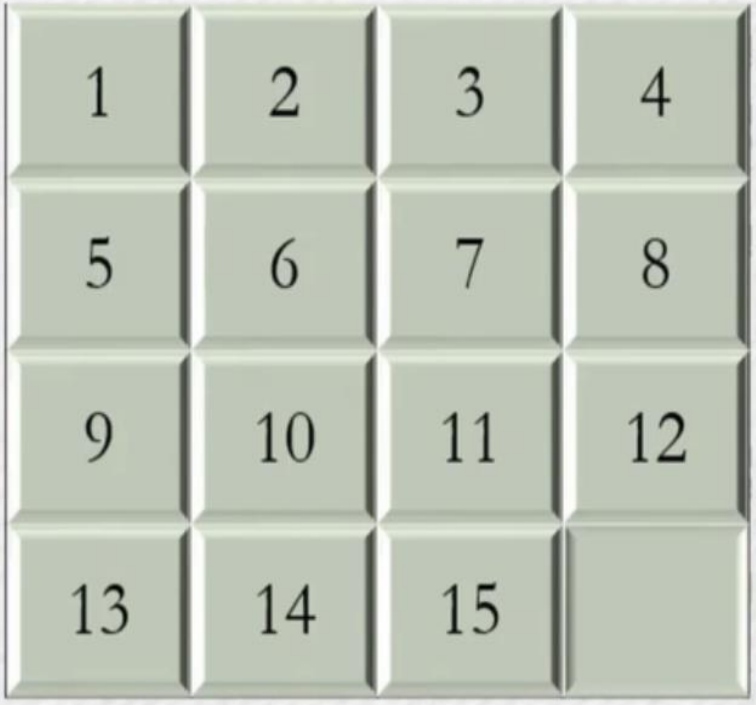
Initial State


1 2 3 4
5 6 8
9 10 7 11
13 14 15 12
L
R
D
U
1 2 3 4
5 6 8
9 10 7 11
13 14 15 12
1 2 3 4
5 6 8
9 10 7 11
13 14 15 12
1 2 3 4
5 6 7 8
9 10 11
13 14 15 12
1 2 4
5 6 3 8
9 10 7 11
13 14 15 12
Cost of a state
=
Distance from initial state
+
Distance from goal state

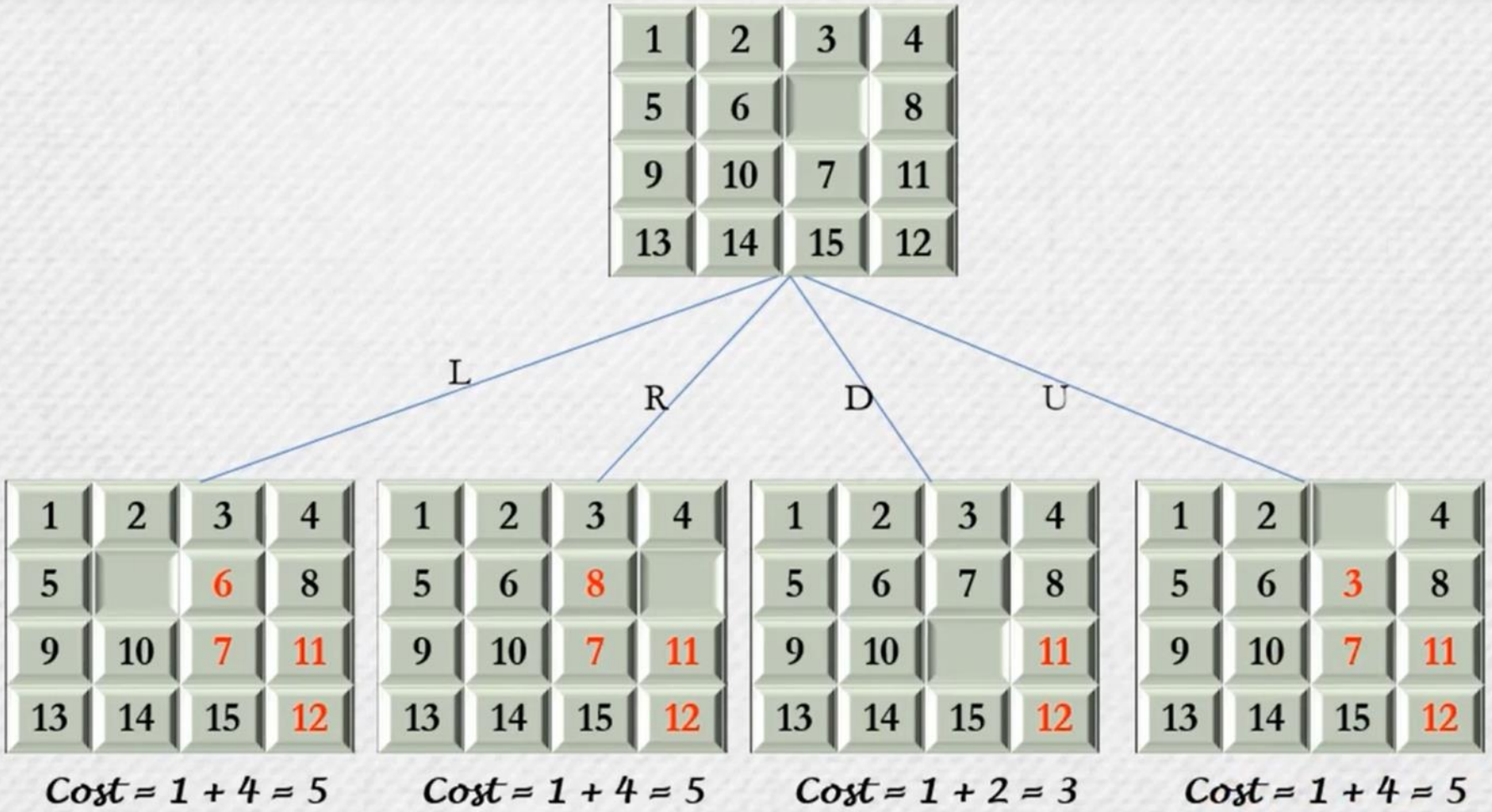
Estimated Cost

Distance From GOAL State = Number of tiles NOT in GOAL position

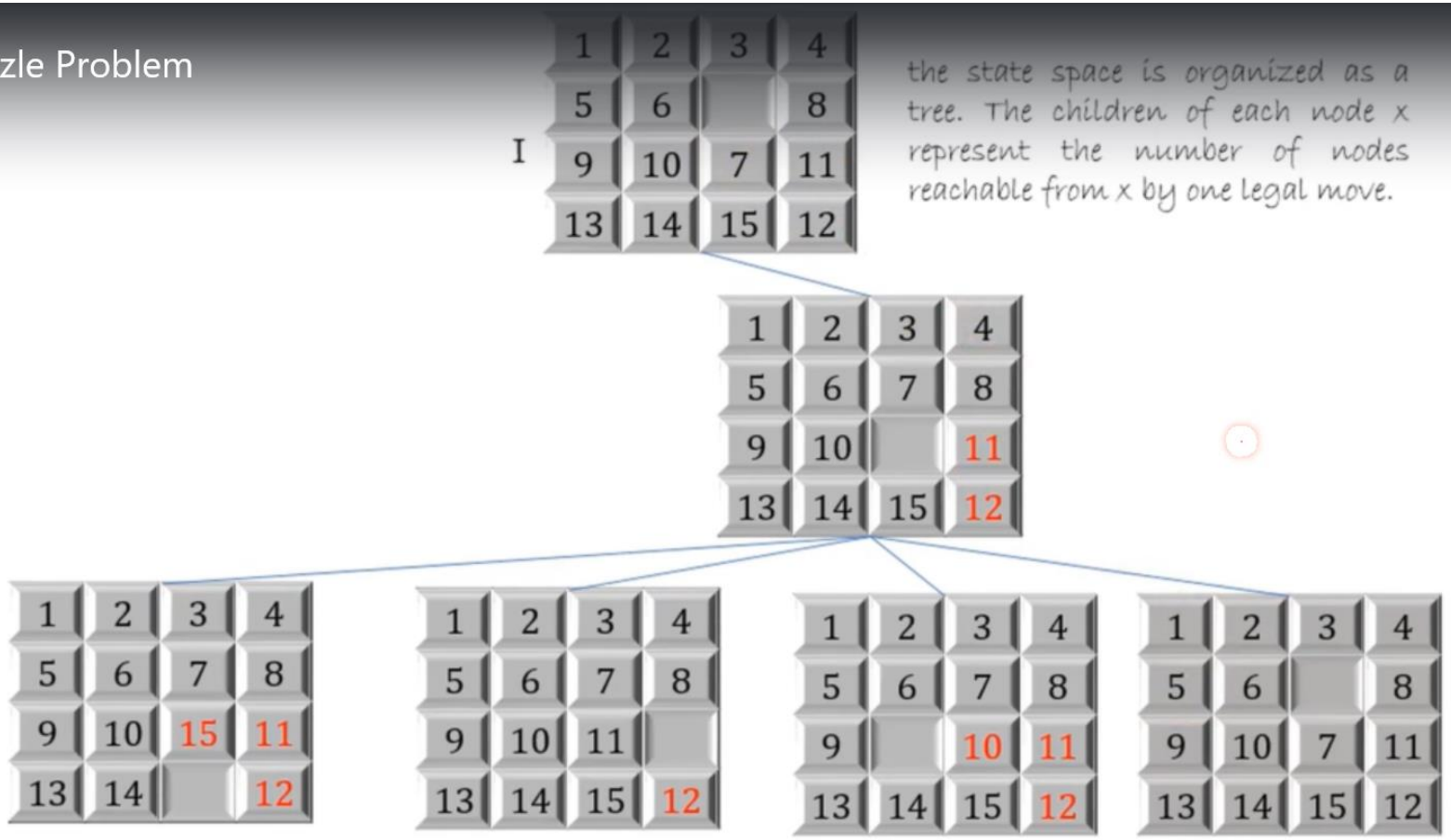
Initial State



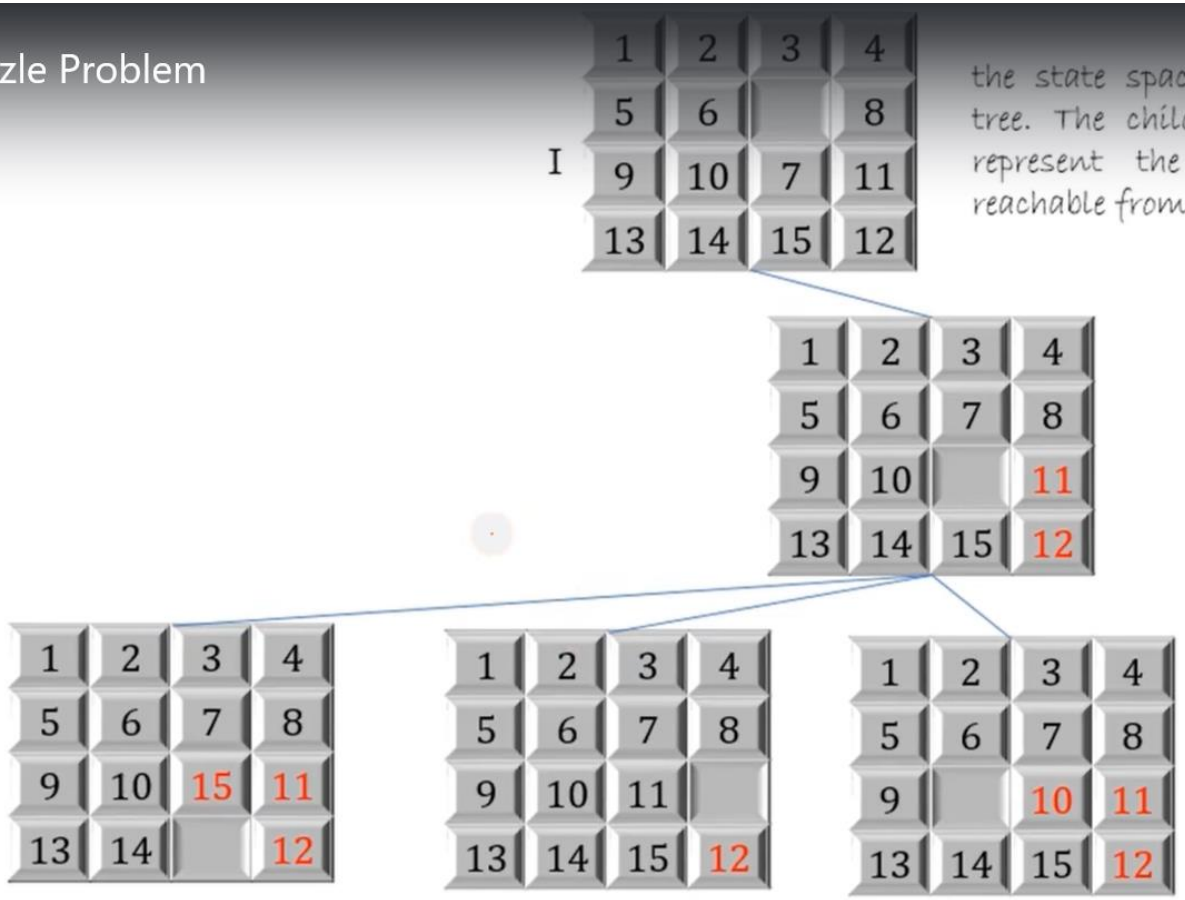
Goal State


1 2 3 4
5 6 8
9 10 7 11
13 14 15 12
L
R
D
U
1 2 3 4
5 6 8
9 10 7 11
13 14 15 12
Cost = 1 + 4 = 5
1 2 3 4
5 6 8
9 10 7 11
13 14 15 12
Cost = 1 + 4 = 5
1 2 3 4
5 6 7 8
9 10 11
13 14 15 12
Cost = 1 + 2 = 3
1 2 4
5 6 3 8
9 10 7 11
13 14 15 12
Cost = 1 + 4 = 5

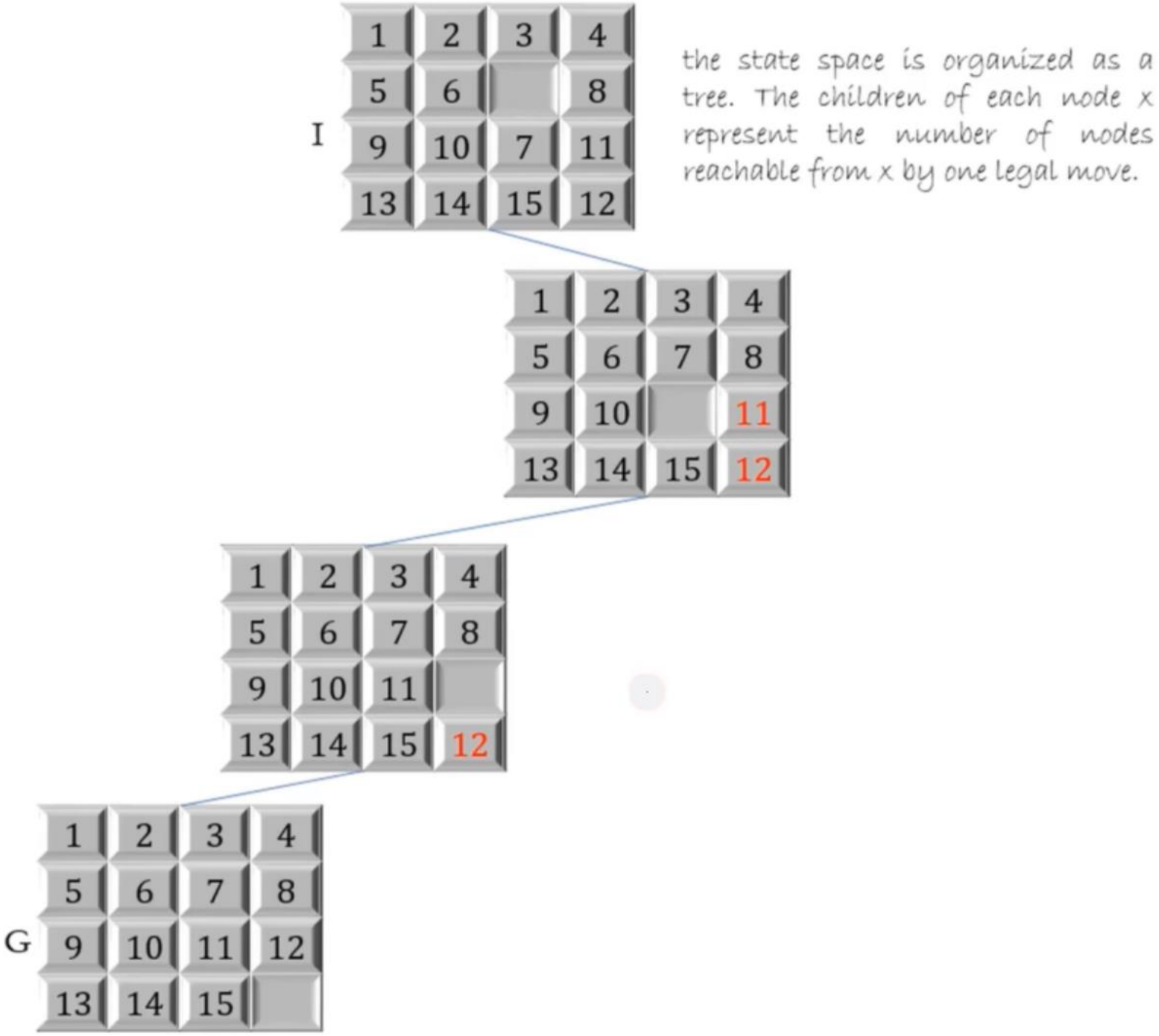
The 15 Puzzle Problem



. The 15 Puzzle Problem



the state space is organized as a tree. The children of each node x represent the number of nodes reachable from x by one legal move.



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