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# Principles of AI Planning

## Exercise Sheet 5

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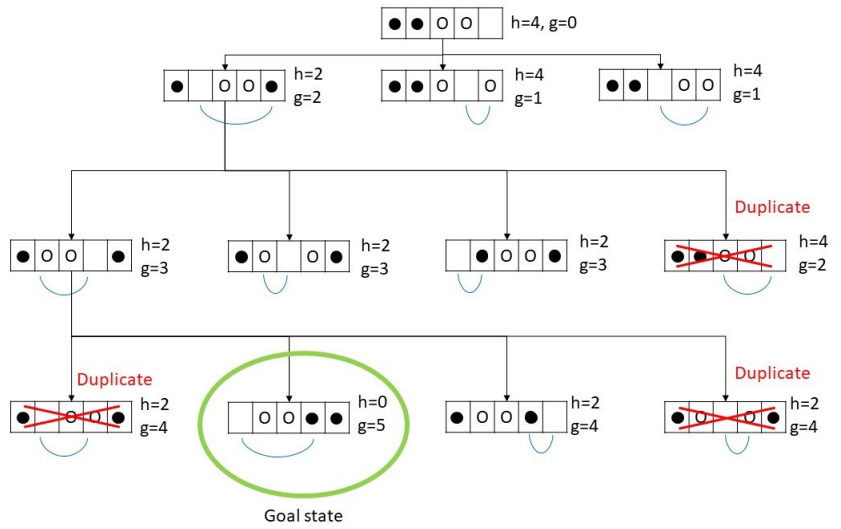
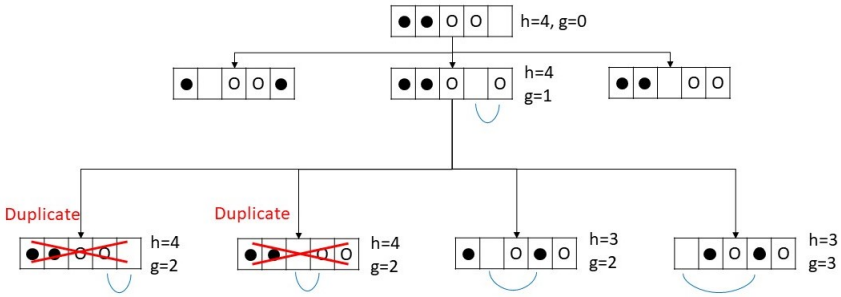
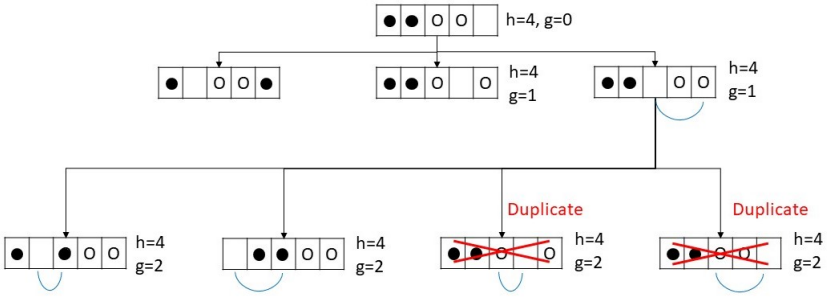
## Exercise 5.1: A* search

### a) Solve the puzzle with the A* algorithms






**b) show that h is admissible**

Given an initial state with a black tile to the left of a white tile, the only way that a black tile can reach the goal state is if it jumps this white tile. The cost of jumping over one tile is at least 1, and if it jumps over two tiles then the cost is 2. This means that the cost of each black tile, to reach the right end, is at least the number of white tiles to the right, which is precisely our heuristic. Therefore $h(s) \leq h^*(s)$ then the heuristic is *admissible*

## Exercise 5.2: Enforced hill-climbing

a) **For each invocation of the `improve` procedure, specify the state after improvement by giving the new coodinates**

b) **Record the solution plan**