Exam 17/09/2012

The following numbers are to be put in ascending order

4, 1, 3, 2

- At each step, while performing the ordering, it is possible to exchange the number in the i-th position with the number in the j-th position;
- Assume the cost of each move is $|j-i|+1$;
- Consider as the heuristic function $h(n)$ the number of misplaced numbers with respect to the final position;

Is $h(n)$ an admissible heuristic?

Admissibility: the function never overestimate the cost to reach the goal

The heuristic function $h(n)$ is admissible, as it assumes that each number can be put into its place with a cost of one, which underestimates the real cost, which is at least 2.

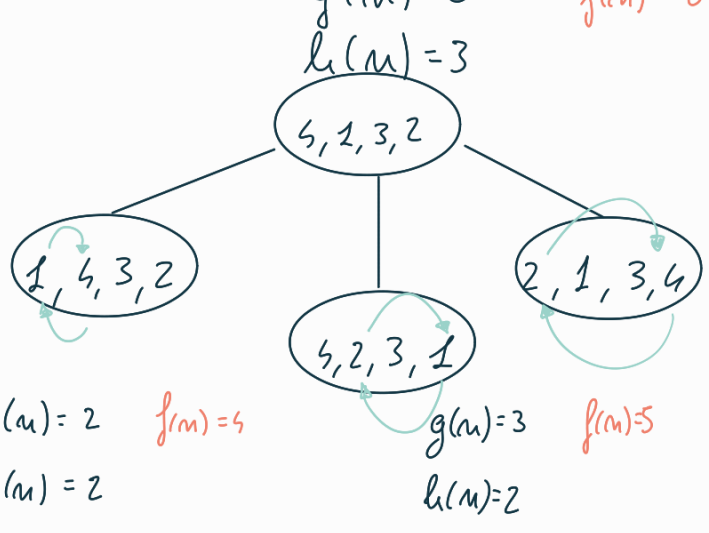
Expand the search tree with A*

$h(n)$ = number of misplaced elements

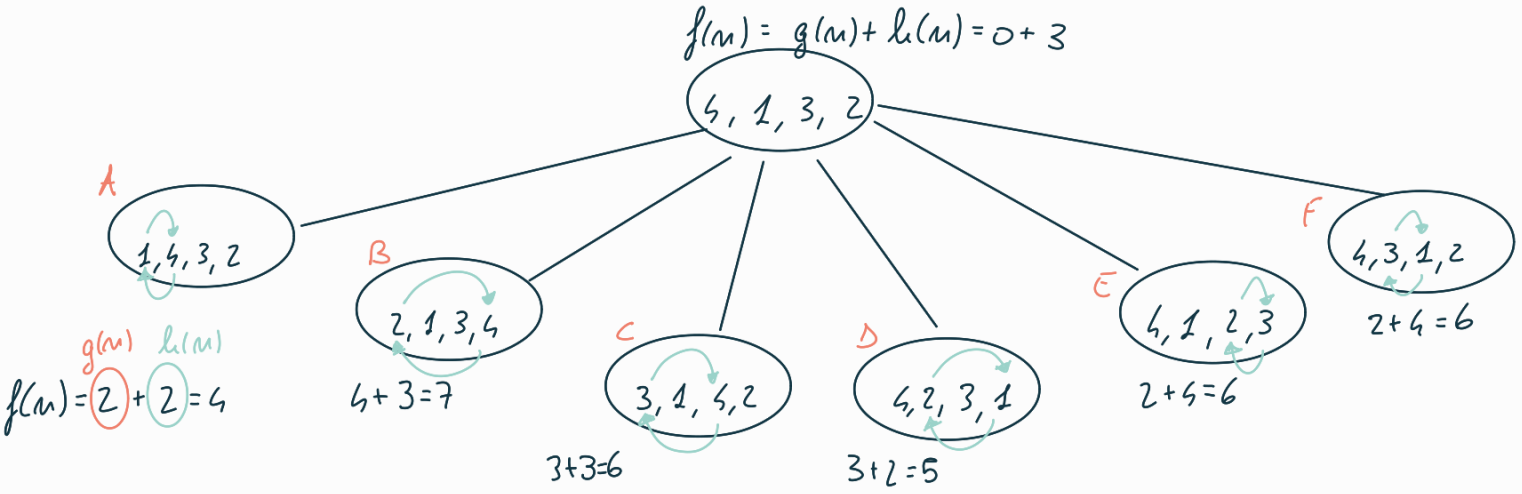
$g(n) = |j-i| + 1$

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

$f(n)$ in the starting state: $g(n) = 0$, $h(n) = 3$



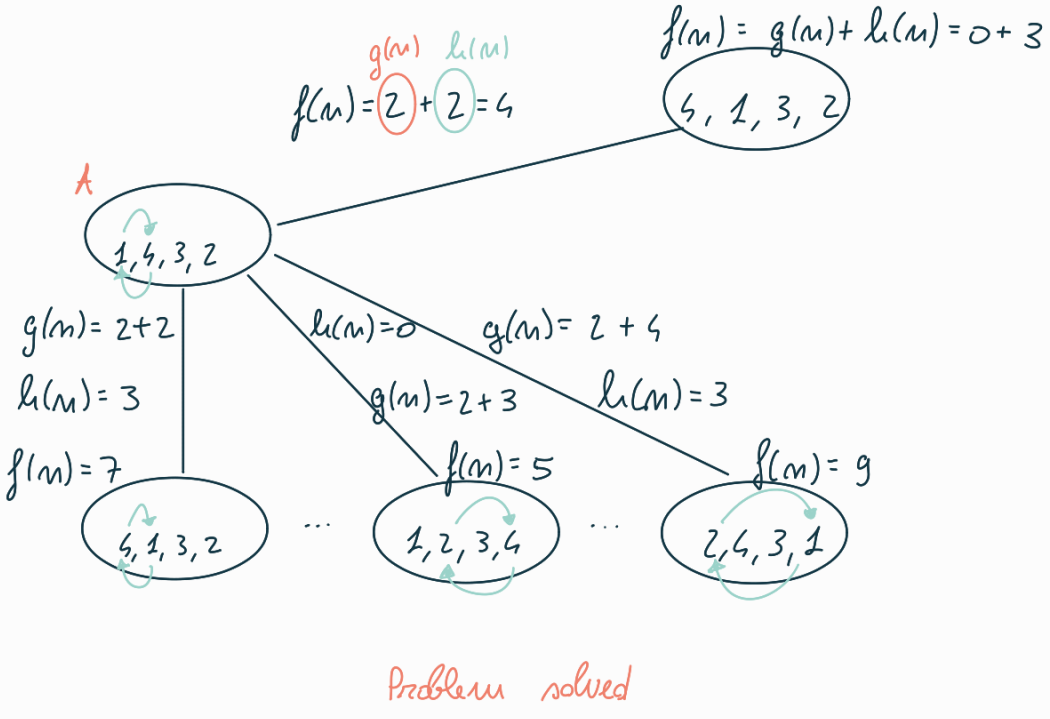
In realty the A* algorithm does not take into account that the 3 is already in the correct position



The f value is calculated for each node and they are ordered by ascending f(n)

{A(4), D(5), C(6), E(6), F(6), B(7)}

We choose to expand A(4)



Problem solved