

Foundations of Artificial Intelligence

Exercise Sheet 3

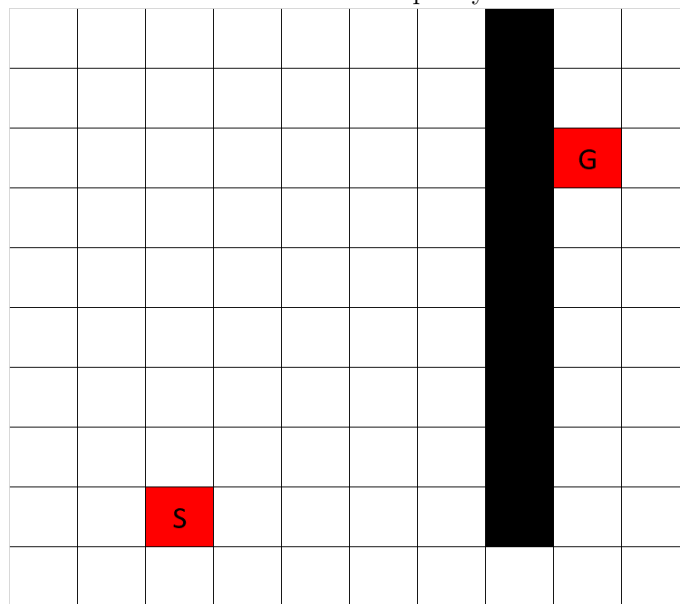
Robin Vogt, Riccardo Salvalaggio, Simon Lempp, Josephine Bergmeier

May 7, 2021

Exercise 3.1

- a) We have a heuristic (for example negated Manhattan distance to the goal). In the hill climbing method we always chose one of the neighbours with a higher or equal quality measure until we're at our goal or stuck at a local maxima. ✓

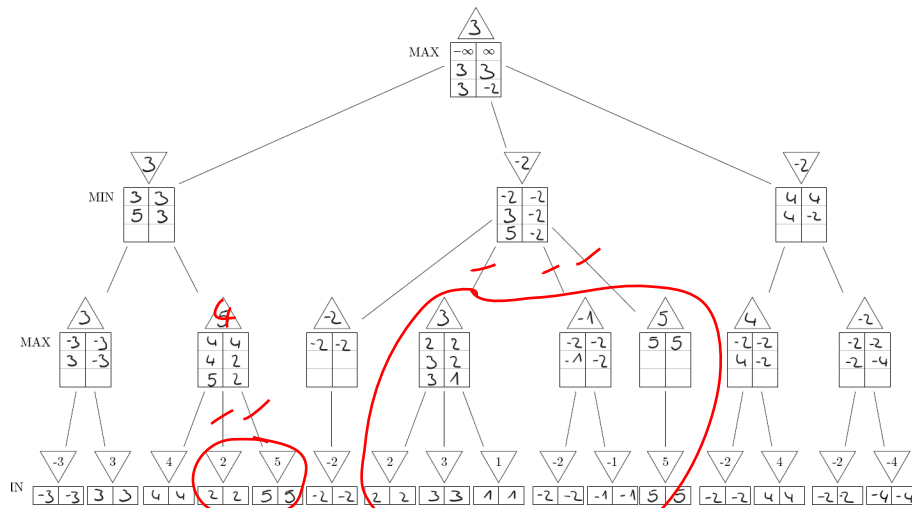
- b) Grid with Manhattan distance as quality measure:



- c) Simulated annealing has a low probability of escaping local maxima at later time steps, because the probability of taking a step in a direction with lower utility decreases with time. By that, if a local maximum occurs close to the goal, the probability to escape it is rather low. ✓

yes, but there still exists a certain probability. :)

Exercise 3.2



pruned because
"4" is already
better than "3"
and therefore
not relevant for
the minimizer

will be pruned, because the minimizer
will at most choose "-2", meaning that
the whole subtree is not relevant for
the maximizer

Exercise 3.3

i	$Assign$	A	B	C	D
0	-	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
1	$A = 1$	1	3, 4	2, 3, 4	1, 2, 3, 4
2	$B = 3$	1	3	/	1, 2, 4
3	$B = 4$	1	4	2	1, 2, 3
4	$C = 2$	1	4	2	/
5	$A = 2$	2	4	1, 3, 4	1, 2, 3, 4
6	$B = 4$	2	4	1	1, 2, 3
7	$C = 1$	2	4	1	3

