Foundations of Artificial Intelligence
Exercise Sheet 3

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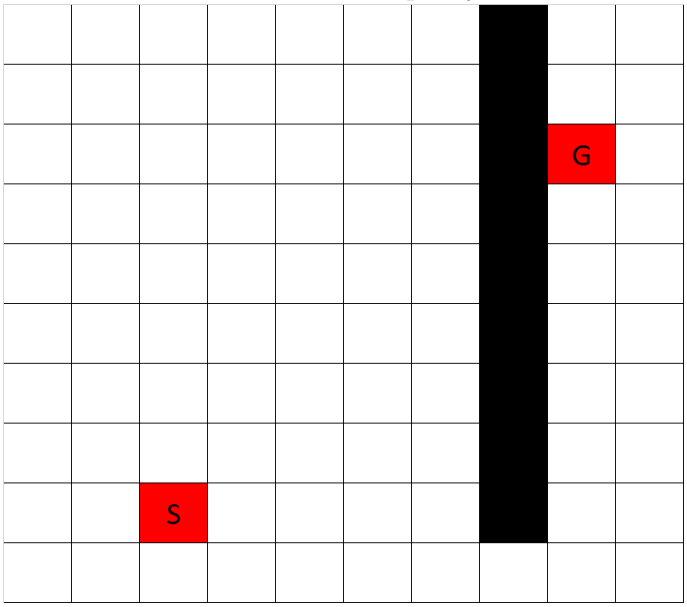
Exercise 3.1

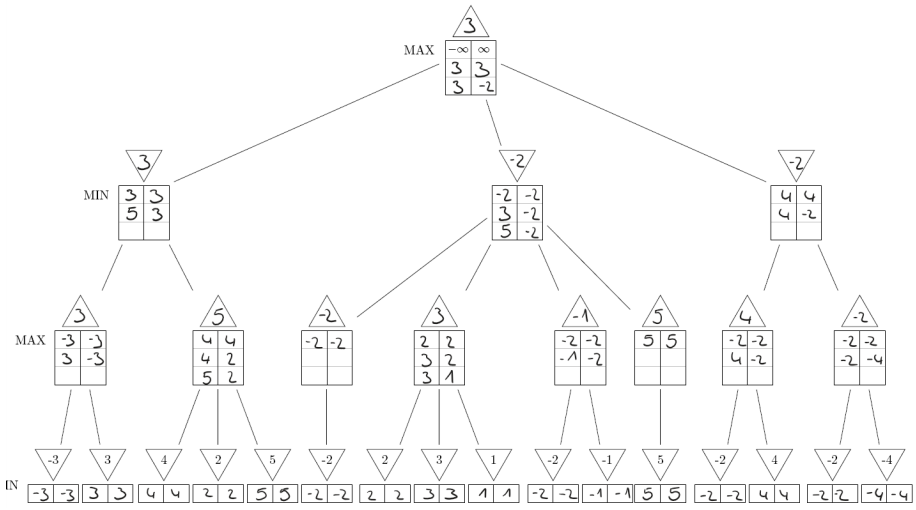
a) We have a heuristic (for example negated Manhattan distance to the goal). In the hill climbing method we always chose one of the neighbours with a higher or equal quality measure until we're at our goal or stuck at a local maxima.

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.

Exercise 3.2



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