

580 2014-03-06

Note Title

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		2					
	②	1	2				
2	1	0	1	2	3	4	5
3	2						6
4			4	10	9	8	2
5	6		10	11	10		
6	7	8	9	10	4		
7	8			11			

↑  
→

4 5

The grid is filled  
in increasing  
h<sup>#</sup> order, 1 at  
a time.

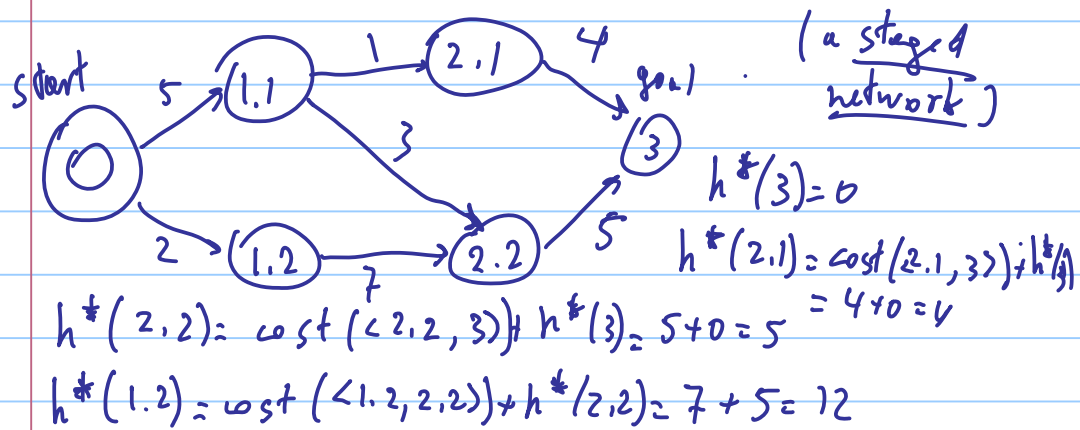
Graph search by Dynamic Programming (DP)

Build a table of path costs backwards.

Let  $\text{cost-to-goal}(n)$  be the actual minimum

cost to the goal node from node  $n$ . (We called this  $h^*(n)$ .)

$$h^*(n) = \text{cost\_to\_goal}(n) = \begin{cases} \emptyset & \text{if } n \text{ is a goal} \\ \min_{(n,m) \in A} (\text{cost}(n,m) + \text{cost\_to\_goal}(m)) & \text{otherwise} \end{cases}$$



$$h^*(1,1) = \min \begin{cases} \text{cost}(\langle 1,1, 2,1 \rangle) + h^*(2,1) = 1 + 4 = 5 \checkmark \\ \text{cost}(\langle 1,1, 2,2 \rangle) + h^*(2,2) = 3 + 5 = 8 \end{cases}$$

$$h^*(0) = \min \begin{cases} \text{cost}(\langle 0, 1,1 \rangle) + h^*(1,1) = 5 + 5 = 10 \checkmark \\ \text{cost}(\langle 0, 1,2 \rangle) + h^*(1,2) = 2 + 12 = 14 \end{cases}$$