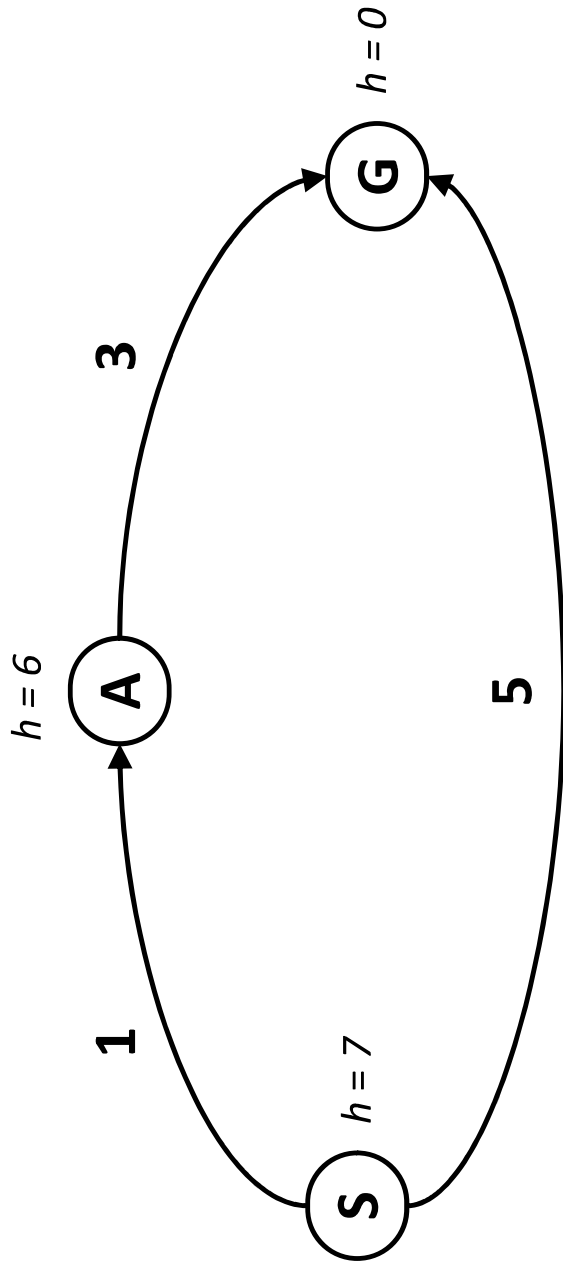


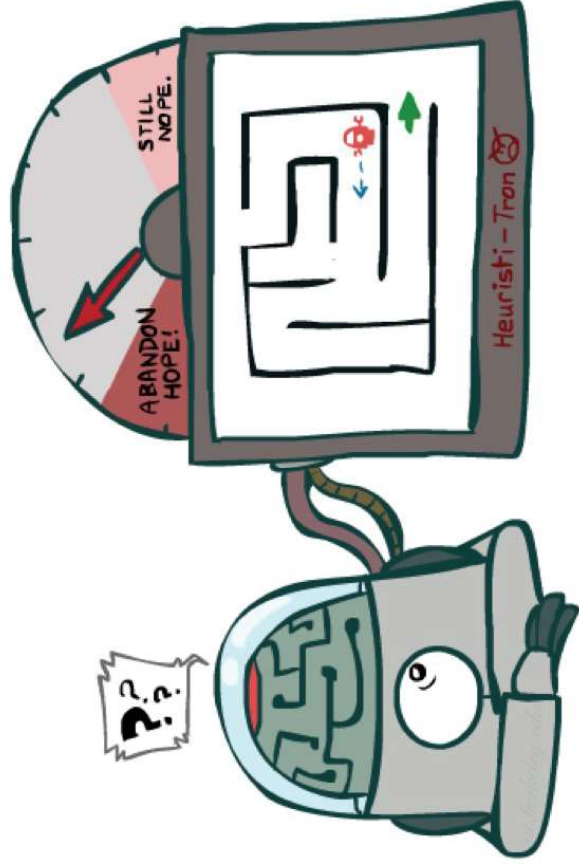
# Is A\* Optimal?



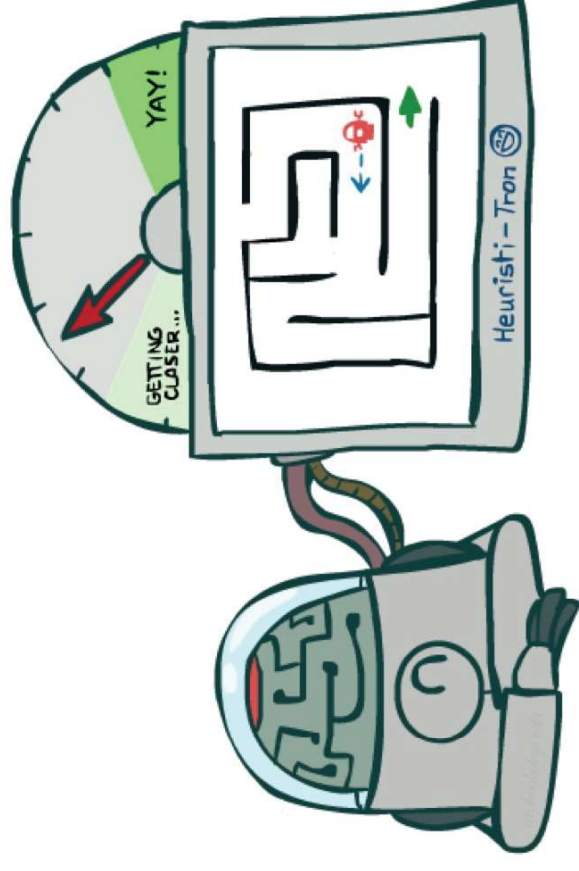
- What went wrong?
- Actual bad goal cost < estimated good goal cost
- We need estimates to be less than actual costs!



# Idea: Admissibility



Inadmissible (pessimistic) heuristics  
break optimality by trapping good plans  
on the fringe



Admissible (optimistic) heuristics never  
outweigh true costs



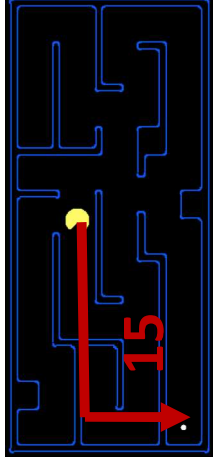
# Admissible Heuristics

- A heuristic  $h$  is *admissible* (optimistic) if:

$$0 \leq h(n) \leq h^*(n)$$

where  $h^*(n)$  is the true cost to a nearest goal

- Examples:



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- Coming up with admissible heuristics is most of what's involved in using  $A^*$  in practice.

