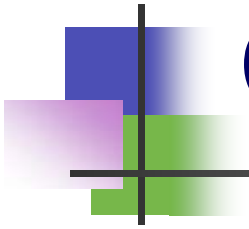
Informed search algorithms

Chapter 4 addendum

(On-line search and
Homework #1 discussion)



Online search and exploration

- Many problems are offline
  - Do search for action and then perform action
- Online search interleave search & execution
  - Necessary for exploration problems
  - New observations only possible after acting

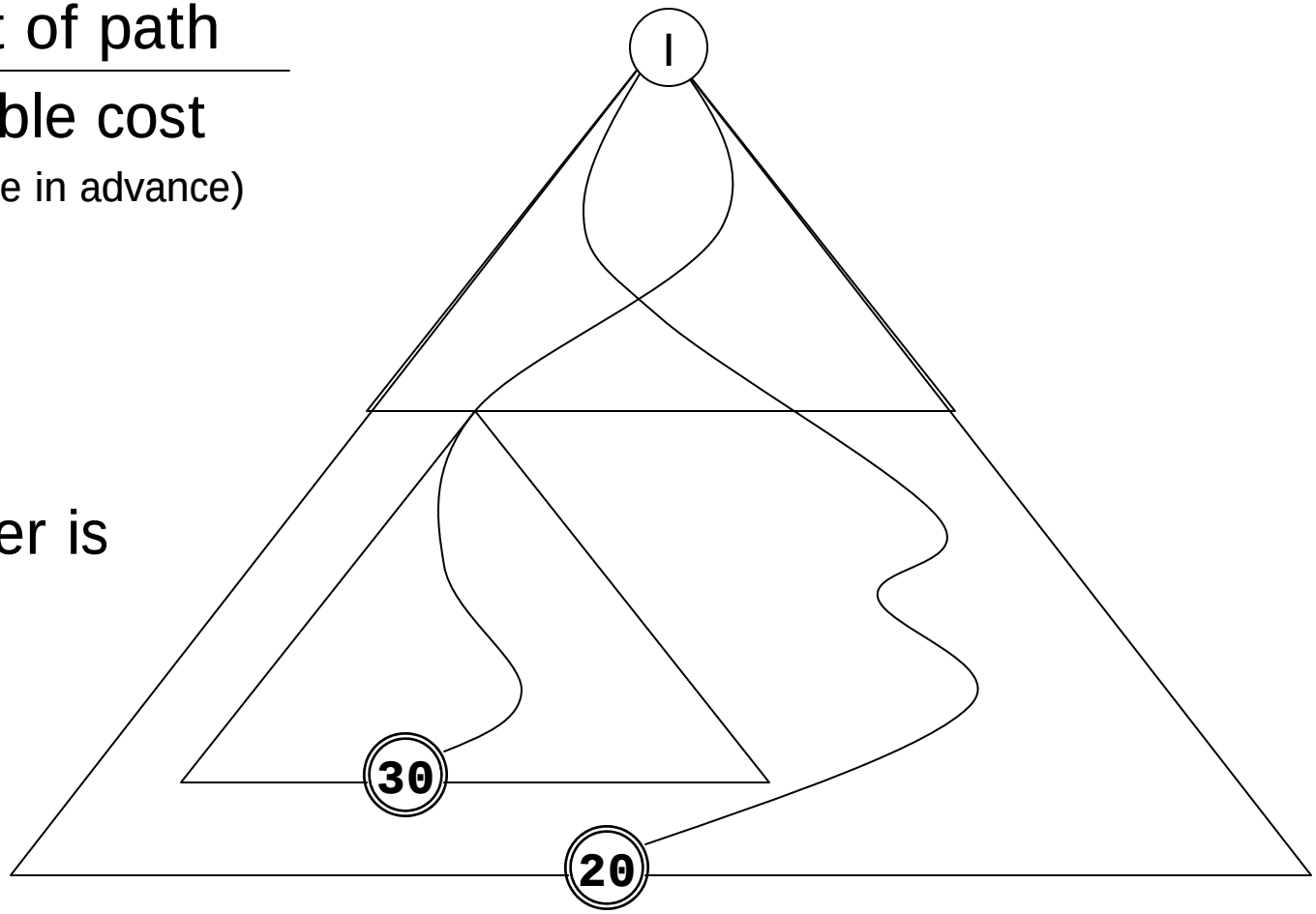
Competitive Ratio

$$\frac{\text{Actual cost of path}}{\text{Best possible cost}}$$

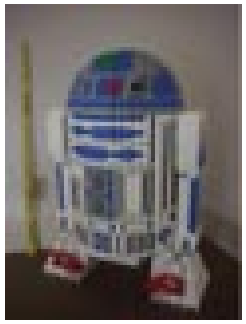
(if agent knew space in advance)

30/20 = 1.5

For cost, lower is better



Exploration problems



- Exploration problems: agent physically in some part of the state space.
  - e.g. solving a maze using an agent with local wall sensors
  - Sensible to expand states easily accessible to agent (i.e. local states)
    - Local search algorithms apply (e.g., hill-climbing)

Homework #1

- What heuristics can be used?
- What type of search algorithm makes sense?
  - No explicit goal state, just an implicit one

Grading of Homework #1

- There are many levels of sophistication in doing this assignment!
  - A solution that only tries to extend the pipeline will get a minimal score
  - A solution that uses search techniques over the queue will have at least an average score
  - A solution that combines this with the use of heuristics will do better.
  - A small but significant portion of your grade will be competitively assigned.