Lecture 11 Uninformed Search Strategies

Artificial Intelligence
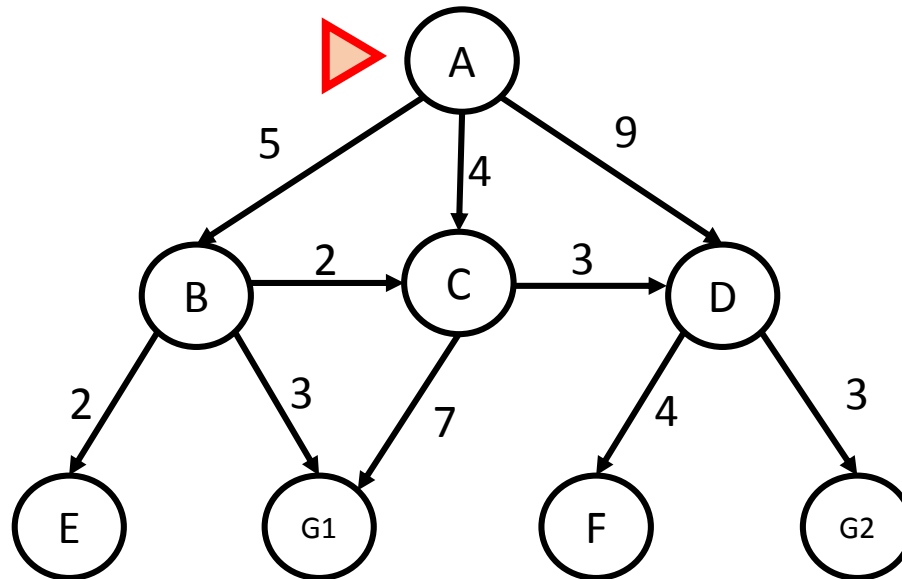
Dr. Ahmed Mateen

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Today's Agenda

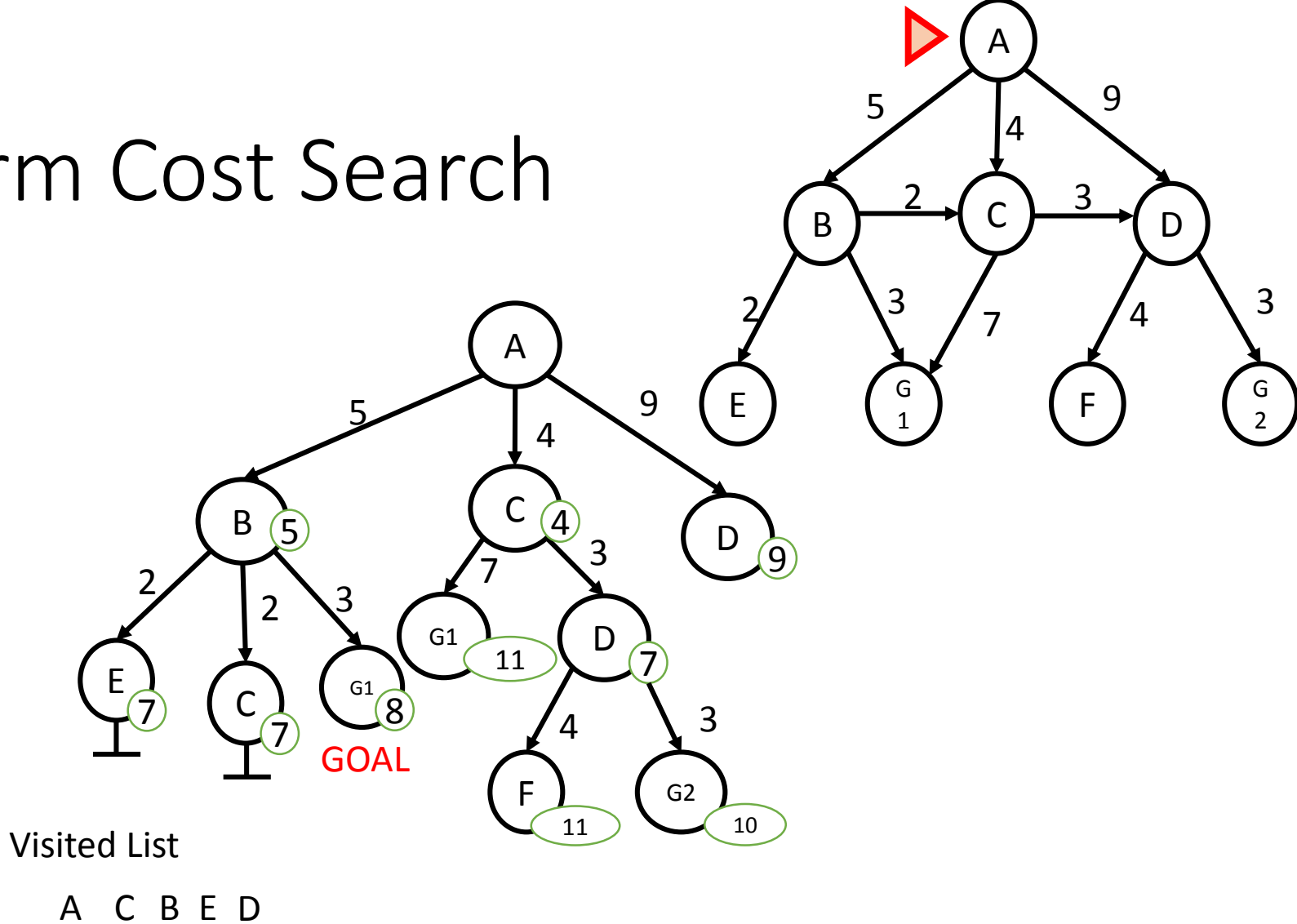- **Uninformed Search**
  - **Uniform Cost Search (UCS)**

Uniform Cost Search

- Same idea as the algorithm for breadth-first search...but...
  - Expand the **_least-cost_** unexpanded node
  - FIFO queue is ordered by cost
  - What if all step costs are equal?
    - Equivalent to regular breadth-first search if all step costs are equal

Uniform Cost Search

Uniform Cost Search

Visited List

A   C   B   E   D

Uniform Cost Search

- Complete
  - Yes
- Time
  - Let C* be the cost of the optimal solution
  - $O(b^{1+(C*/\varepsilon)})$
- Space
  - $O(b^{1+(C*/\varepsilon)})$
- Optimal
  - Yes
- Time and space complexity when all costs are equal?

$$O(b^{1+(C*/\varepsilon)}) = b^{d+1}$$