Artificial Intelligence

Problem solving by searching

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Chapter Description

- Expected Outcomes
  - Student able to review the search method and basic search algorithms
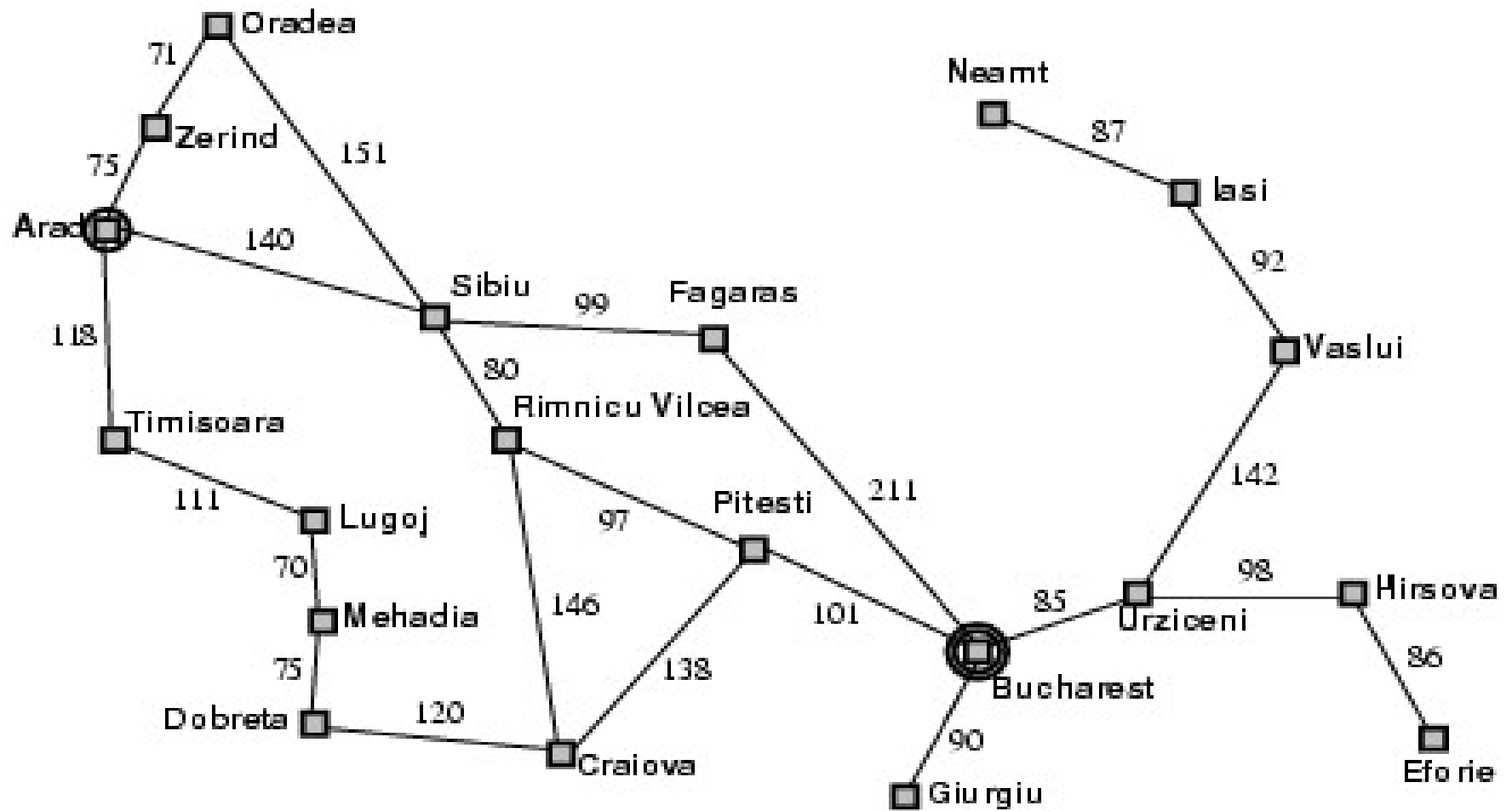
- References
  - ……..

Content #1

- Search methods
- Basic search algorithms

Example: Romania

- On holiday in Romania; currently in Arad.
- Flight leaves tomorrow from Bucharest
- Formulate goal:
  - be in Bucharest
- Formulate problem:
  - states: various cities
  - actions: drive between cities
- Find solution:
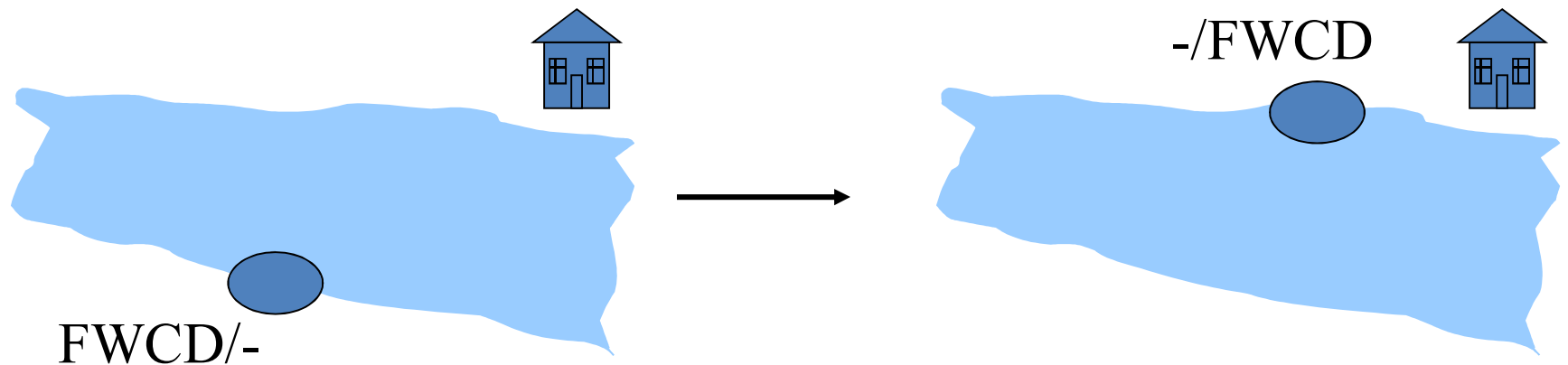 - sequence of cities, e.g., Arad, Sibiu, Fagaras, Bucharest

Example: Romania

- The River Problem:

F=Farmer W=Wolf D=Duck C=Corn /=River
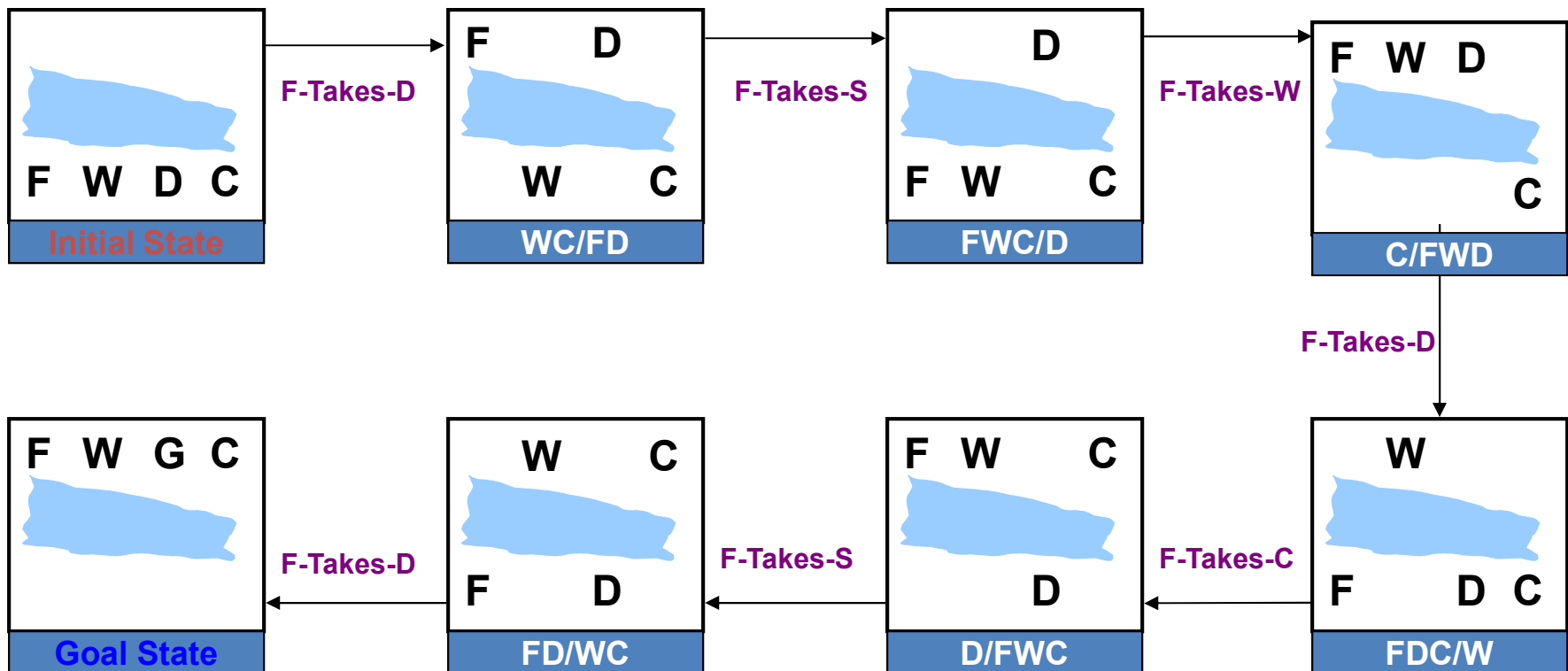
-/FWCD

FWCD/-

How can the farmer safely transport the wolf, the duck and the corn to the opposite shore?

Search Methods

- Problem solution: (path Cost = 7)

While there are other possibilities here is one **7** step solution to the river problem

Basic Search Algorithms

- **uninformed(Blind) search**: breadth-first, depth-first, depth limited, iterative deepening, and bidirectional search

- **informed (Heuristic) search:** search is guided by an evaluation function: Greedy best-first, A*, IDA*, and beam search

- **optimization** in which the search is to find an optimal value of an objective function: hill climbing, simulated annealing, genetic algorithms, Ant Colony Optimization

- **Game playing**, an adversarial search: minimax algorithm, alpha-beta pruning

Conclusion of The Chapter

- ## Conclusion #1
  - Search method provides the possible solution to a problem

- ## Conclusion #2
  - Basic search algorithm divided into four categories :- uninformed, informed, optimization and game playing.