

CS 2710 Foundations of AI
Lecture 2

Problem solving by searching

Milos Hauskrecht

milos@cs.pitt.edu

5329 Sennott Square

Example

- Assume a problem of computing the roots of the quadratic equation

$$ax^2 + bx + c = 0$$

Do you consider it a challenging problem?

Example

- Assume a problem of computing the roots of the quadratic equation

$$ax^2 + bx + c = 0$$

Do you consider it a challenging problem?

Hardly we just apply the standard formula:

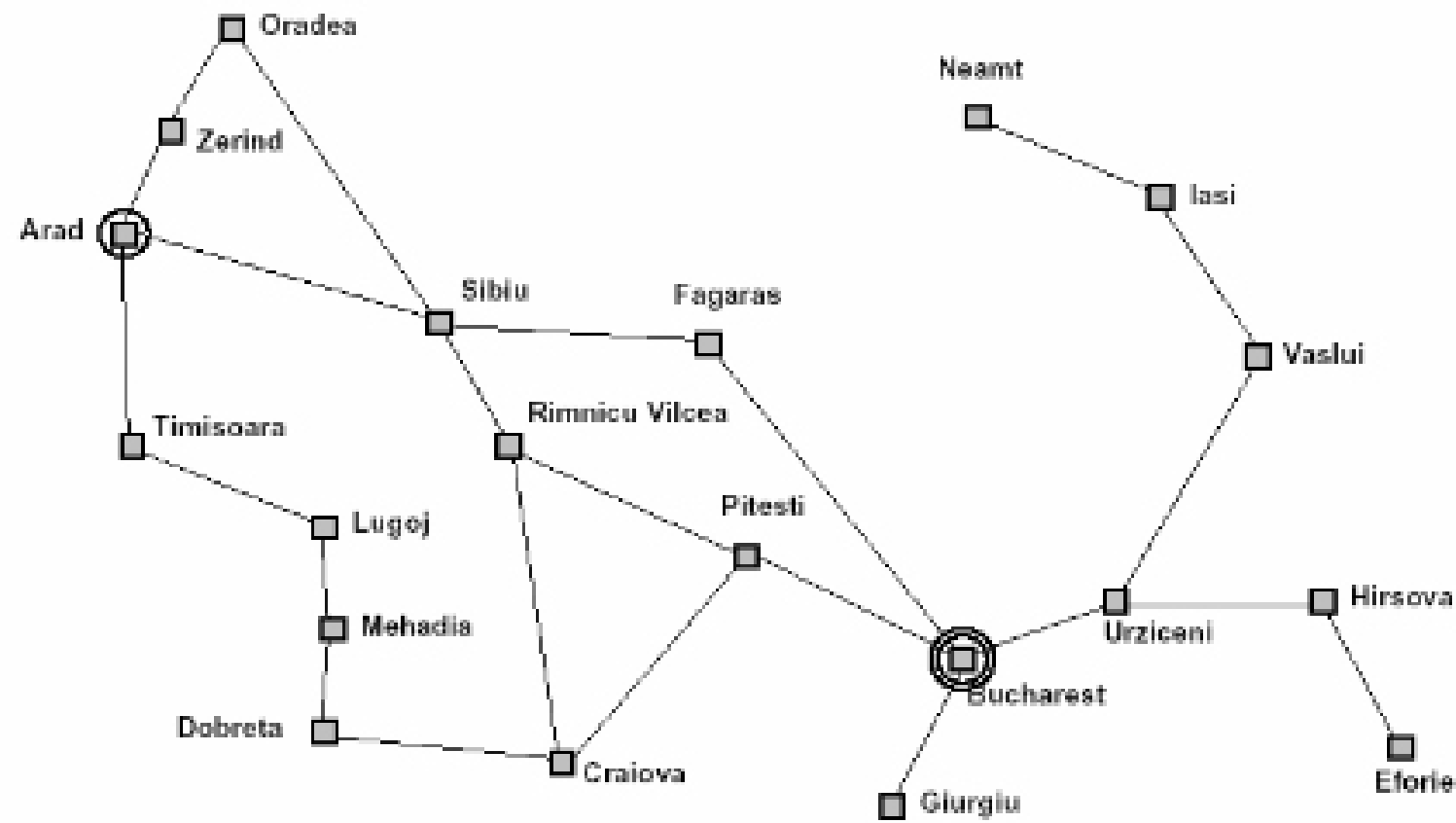
$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solving problems by searching

- Some problems have a straightforward solution
 - Just apply the formula, or follow a standardized procedure
 - Example:** solution of the quadratic equation
 - Hardly a sign of intelligence
- More interesting problems require **search**:
 - more than one possible alternative needs to be explored before the problem is solved
 - the number of alternatives to search among can be very large, even infinite.

Search example: Traveler problem

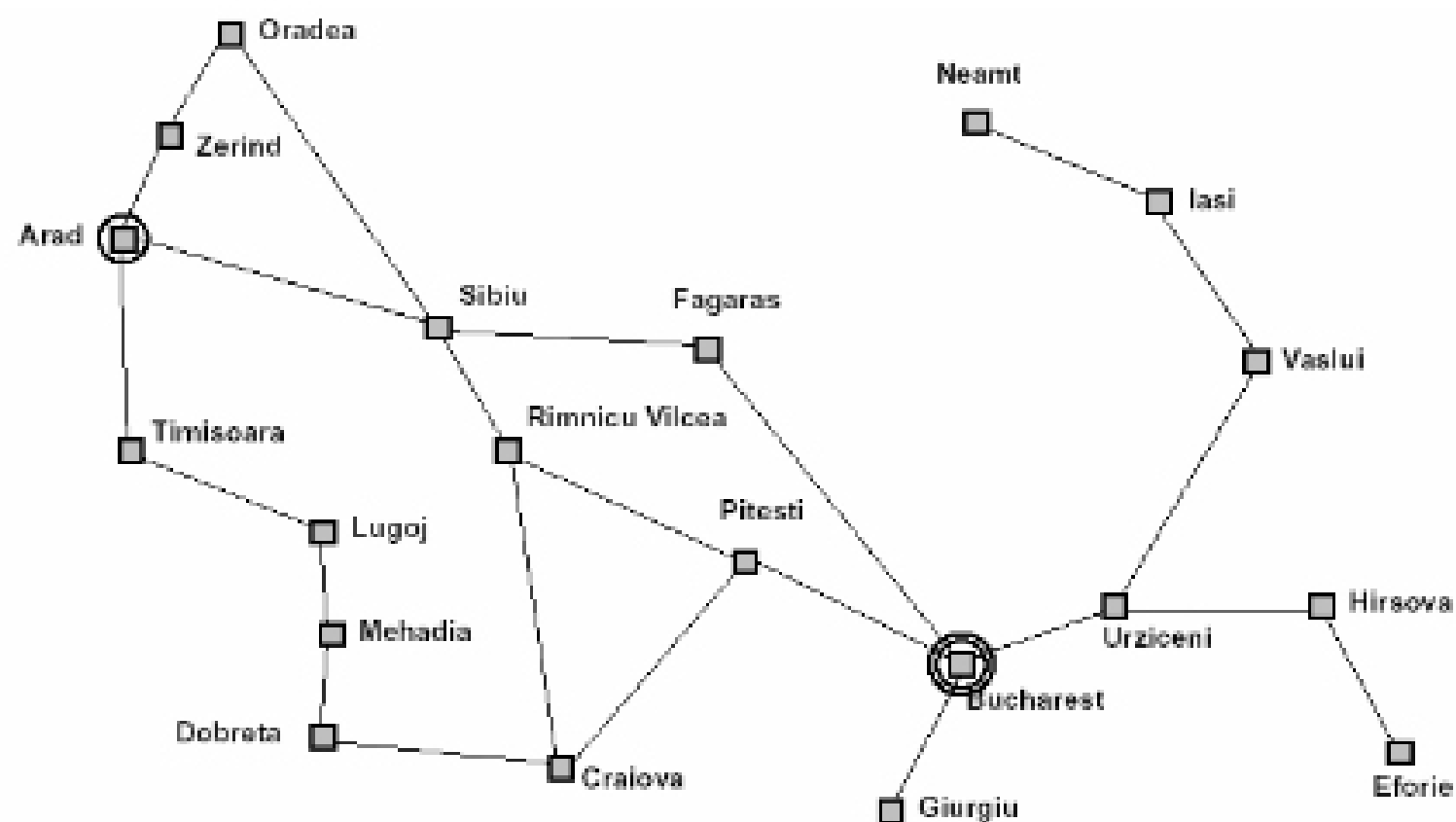
- Find a route from one city (**Arad**) to the other (**Bucharest**)



CS 2710 Foundations of AI

Example. Traveler problem

- Another flavor of the traveler problem:
 - find the route with the minimum length between S and T



CS 2710 Foundations of AI