

## Algorithms and Data Structures: Quiz 3

**Due: Wednesday, Feb. 11th 13:30 (before class)**

- Let's assume there are eight different cities in Germany numbered from 1 to 8. The distances between the cities (in kilometers) are given in Table 1 below. The government wants to connect these cities and is planning a project to build several roads between the cities. Every kilometer of road costs 100,000 Euros. The goal is to minimize the cost of the project while ensuring that each city is reachable by every other city.
  - What data structures would you choose to represent the problem?
  - What algorithm would you use to solve the problem? Write the algorithm in pseudo-code.
  - Finally, apply the algorithm to solve the problem instance given above. How much will the government have to spend on the project?

1	2	3	4	5	6	7	8
	240	210	340	280	200	345	120
		265	175	215	180	185	155
			260	115	350	435	195
				160	330	295	230
					360	400	170
						175	205
							305

Table 1: The distances in kilometers between the 8 cities.