



IE 522 – Optimization Methods:

**Transportation and assignment
problems**

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Problem 1 (section 7.1)

1 A company supplies goods to three customers, who each require 30 units. The company has two warehouses. Warehouse 1 has 40 units available, and warehouse 2 has 30 units available. The costs of shipping 1 unit from warehouse to customer are shown in Table 7. There is a penalty for each unmet customer unit of demand: With customer 1, a penalty cost of \$90 is incurred; with customer 2, \$80; and with customer 3, \$110. Formulate a balanced transportation problem to minimize the sum of shortage and shipping costs.

TABLE 7

From	To		
	Customer 1	Customer 2	Customer 3
Warehouse 1	\$15	\$35	\$25
Warehouse 2	\$10	\$50	\$40

Problem 2 (section 7.5)

2[†] Doc Councillman is putting together a relay team for the 400-meter relay. Each swimmer must swim 100 meters of breaststroke, backstroke, butterfly, or freestyle. Doc believes that each swimmer will attain the times given in Table 51. To minimize the team's time for the race, which swimmer should swim which stroke?

TABLE 51

Swimmer	Time (seconds)			
	Free	Breast	Fly	Back
Gary Hall	54	54	51	53
Mark Spitz	51	57	52	52
Jim Montgomery	50	53	54	56
Chet Jastremski	56	54	55	53