Chapter 6

1. Consider the following transportation problem:

From	To (Cost)			Supply
	1	2	3	
A	6	5	5	150
B	11	8	9	85
C	4	10	7	125
Demand	70	100	80	

Formulate this problem as a linear programming model and solve it by the using the computer.

2. Consider the following transportation problem:

From	To (Cost)			Supply
	1	2	3	
A	8	14	8	120
B	6	17	7	80
C	9	24	10	1·50
Demand	110	140	100	

Solve it by using the computer.

3. World foods, Inc. imports food products such as meats, cheeses, and pastries to the United States from warehouses at ports in Hamburg, Marseilles and Liverpool. Ships from these ports deliver the products to Norfolk, New York and Savannah, where they are stored in company warehouses before being shipped to distribution centers in Dallas, St. Louis and Chicago. The products are then distributed to specialty foods stores and sold through catalogs. The shipping costs ($/1,000 lb.) from the European ports to the U.S. cities and the available supplies (1000 lb.) at the European ports are provided in the following table:

From	To (Cost)			Supply
	4. Norfolk	5. New York	6. Savannah	
1. Hamburg	320	280	555	75
2. Marseilles	410	470	365	85
3. Liverpool	550	355	525	40

The transportation costs ($/1000 lb.) from each U.S. city of the three distribution centers and the demands (1000 lb.) at the distribution centers are as follows:

Warehouse	Distribution Center		
	7. Dallas	8. St. Louis	9. Chicago
4. Norfolk	80	78	85
5. New York	100	120	95
6. Savannah	65	75	90
Demand	85	70	65

Determine the optimal shipments between the European ports and the warehouses and the distribution centers to minimize total transportation costs.

4. The Omega Pharmaceutical firm has five salespersons, whom the firm wants to assign to five sales regions. Given their various previous contacts, the sales persons are able to cover the regions in different amounts of time. The amount of time (days) required by each salesperson to cover each city is shown in the following table:

Salesperson	Region (days)				
	A	B	C	D	E
1	20	10	12	10	22
2	14	10	18	11	15
3	12	13	19	11	14
4	16	12	14	22	16
5	12	15	19	26	23

Which salesperson should be assigned to each region to minimize total time? Identify the optimal assignments and compute total minimum time.