

Homework for 7.1

Note that we did Exercise 1 in class.

Homework: Exercise 3(*) (look at example 3), 10. There are two additional problems below- One is to use a spreadsheet to solve, the other will be a critical point about the rank of a certain matrix.

- 7.1.13(*) One of the main products of the P & T Company is canned peas. The peas are prepared at three canneries (near Bellingham, WA; Eugene, OR; and Albert Lea, MN), and then shipped by truck to four distribution warehouses in the western US (Sacramento, Salt Lake City, Rapid City, and Albuquerque).

Because the shipping costs are a major expense, management is initiating a study to reduce them as much as possible.

For the upcoming season, an estimate has been made of the output from each cannery, and each warehouse has been allocated a certain amount from the total supply of peas.

This information (in units of truckloads), along with the transportation costs, is given in the table below. There are 300 truckloads to be distributed. Use a spreadsheet to formulate this as a transportation problem, and solve it using the spreadsheet's solver. You may use the spreadsheet on the class website as a template.

	Warehouse				Output
	1	2	3	4	
1	464	513	654	867	75
Cannery 2	352	416	690	791	125
3	995	682	388	685	100
Allocation	80	65	70	85	

- 7.1.14 Consider a balanced transportation problem in terms of its original linear program with constraints.

Show that any supply constraint exactly equals the sum of the demand constraints, minus the sum of the other supply constraints. This shows that one row is a linear combination of the others.

Hint: Do you notice anything about the sum of the supply constraints versus the sum of the demand constraints?