

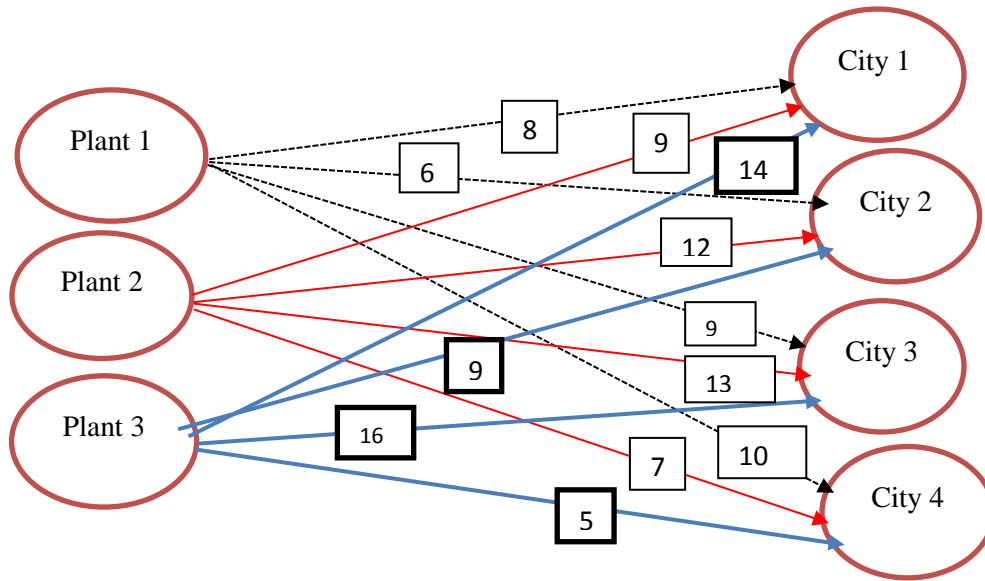
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Department of Mathematics
Linear optimization Assignment

- Each month a store owner can spend at most \$100,000 on PC's and laptops. A PC costs the store owner \$1000 and a laptop costs him \$1500. Each PC is sold for a profit of \$400 while laptop is sold for a profit of \$700. The store owner estimates that at least 15 PC's but no more than 80 are sold each month. He also estimates that the number of laptops sold is at most half the PC's. How many PC's and how many laptops should be sold in order to maximize the profit?
- A candy manufacturer has 130 pounds of chocolate-covered cherries and 170 pounds of chocolate-covered mints in stock. He decides to sell them in the form of two different mixtures. One mixture will contain half cherries and half mints by weight and will sell for \$2.00 per pound. The other mixture will contain one-third cherries and two-thirds mints by weight and will sell for \$1.25 per pound. How many pounds of each mixture should the candy manufacturer prepare in order to maximize his sales revenue?
- The Osgood County refuse department runs two recycling centers. Center 1 costs \$40 to run for an eight hour day. In a typical day 140 pounds of glass and 60 pounds of aluminum are deposited at Center 1. Center 2 costs \$50 for an eight-hour day, with 100 pounds of glass and 180 pounds of aluminum deposited per day. The county has a commitment to deliver at least 1540 pounds of glass and 1440 pounds of aluminum per week to encourage a recycler to open up a plant in town. How many days per week should the county open each center to minimize its cost and still meet the recycler's needs?
- A company making cool drinks has 2 bottling plants located at towns T1 and T2. Each plant produces 3 drinks A, B and C and their production capacity per day is given in the table.

Cool drinks	Plant at	
	T1	T2
A	6000	2000
B	1000	2500
C	3000	3000

The marketing department of the company forecasts a demand of 80000 bottles of A, 22000 bottles of B and 40000 bottles of C during the month of June. The operating cost per day of plants at T1 and T2 are Rs. 6000 and Rs. 4000 respectively. Find graphically the number of days for which each plant must be run in June so as to minimize the operating cost while meeting the market demand.

5. An electric power corporation has 3 electric power plants that supply the needs of 4 cities. Each power plant can supply the following numbers of kilowatt-hours (kWh) of electricity: plant 1= 35 million; plant 2 = 50 million; plant 3 =40 million. The peak power demands in these cities, which occur at the same time (2pm), are as follows (in kWh): city 1 =45 million; city 2 =20 million; city 3 =30 million; city 4 =30 million. The costs of sending 1 million kWh of electricity from plant to city depend on the distance the electricity must travel and the cost of travelling is given by the following diagram (in each box).



- Summarize the problem in transportation table. **(2pts)**
- Find the initial BFS by NWCR; **(3pts)**

c. Find the optimal cost (use (b));

(6pts)