

Module : Operations Research 1

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Exercise sheet 4

Transportation Methods

This exercise sheet will be covered in the in-class meetings. There are two different types of exercises:

Home: This exercise should be solved by you alone before/after the in-class meeting.

In-class: This exercise will be solved during the in-class meeting. I will give you some time where you can discuss and solve the exercise in a small group. Afterwards, we will discuss possible solutions.

Exercise 1: (In-class)

Suppose a manufacturing company owns three factories (sources) and distribute his products to five different retail agencies (destinations). The following table shows the capacities of the three factories, the quantity of products required by the various retail agencies and the cost of shipping one unit of the product from each of the three factories to each of the five retail agencies.

Factories	Retail Agency					Capacity
	1	2	3	4	5	
1	1	9	13	36	51	50
2	24	12	16	20	1	100
3	14	33	1	23	26	150
Requirement	100	60	50	50	40	300

Task:

1. Design a mathematical model which minimize the costs and explain all of its components.
2. Solve this problem using Min Cost method, then using Vogel's method.

Exercise 2: (Home)

Consider the (minimization) transportation problem below.

	D1	D2	D3	D4	Source
S1	11	20	7	8	35
S2	21	16	10	12	40
S3	8	12	18	9	55
Sink	30	25	35	40	

Task:

1. Give the graphical representation of the Problem
2. Find a solution to the problem using Min Cost method and give the value of Z.
3. Find a solution to the problem using Vogel's method and give the value of Z.