* Transportation Problem of Linear Programming :

In the problem of transportation of goods, the objective is to determine the optimum amount of goods to be transported from each warehouse to each of the retaile stores in order to minimize the total costs of transportation.

Let us consider a simple transportation problem where three retaile shops transport goods from each of the two warehouses. It is assumed that the first warehouse (WH-1) has maximum capacity of storing w_1 tonnes while second warehouse (WH-2) has the maximum capacity of w_2 tonnes. On the other hand, each of the retail shops has a minimum daily requirement. Let us assume that the minimum daily requirement of three retail shops, namely RS-1, RS-2, and RS-3 are r_1, r_2, r_3 respectively.

The cost of transportation/unit of output from each warehouse to each of the retail shops are also different. Let C_{11}, C_{12} and C_{13} represent the unit cost of transportation from first warehouse to each of the ~~three~~ three retail shops respectively.

Similarly, C_{21}, C_{22} and C_{23} represent the unit cost of transportation of goods from second warehouse to each retail shops respectively.

We also assume that x_{11}, x_{12} and x_{13} are the amount of goods transported from first warehouse to three retail shops respectively. Similarly, x_{21}, x_{22} and x_{23} are the amount of goods transported from second warehouse to the each of the three retail shops. Mathematically, we state the above problem of goods transportation as

Minimize the cost of transport

$$C = C_{11}x_{11} + C_{12}x_{12} + C_{13}x_{13} + C_{21}x_{21} + C_{22}x_{22} + C_{23}x_{23}$$

Subject to

$$x_{11} + x_{12} + x_{13} \leq w_1$$

$$x_{21} + x_{22} + x_{23} \leq w_2$$

$$x_{11} + x_{21} \geq r_1$$

$$x_{12} + x_{22} \geq r_2$$

$$x_{13} + x_{23} \geq r_3$$

$$x_{11}, x_{12}, x_{13}, x_{21}, x_{22}, x_{23} \geq 0$$