Summary

- One important application of linear programming has been in the area of the physical distribution (transportation) of resources, from one place to another, to meet a specific set of requirements
- It is easy to express a transportation problem mathematically in terms of an LP model, which can be solved by the simplex method. Since a transportation problem involves a large number of variables and constraints, it takes a very long time to solve it by the simplex method
- Simpler ways, involving transportation algorithms, namely the Stepping Stone Method and the MODI (modified distribution) Method, have been evolved for this purpose
- The structure of transportation problem involves a large number of shipping routes from several supply origins to several demand destinations. The objective is to determine the number of units of an item that should be shipped from an origin to a destination to satisfy the required quantity of goods or services at each destination center. This should be done within the limited quantity of goods or services available at each supply center, at the minimum transportation cost and or time
- The transportation algorithm discussed is applied to minimize the total cost of transporting a homogeneous commodity from one supply center to demand centers. However, it can also be applied to the maximization of some total value or utility; for example, financial resources are distributed in such a way that the profitable return is maximized
- There are various types of transportation models and the simplest of them was first presented by F L Hitchcock in the year 1941 and later on further development was contributed by TC Koopmans in the year 1949 and G B Dantzig in the year 1951
- An ordered set of at least four cells in a transportation table is said to form a loop provided:
 - Any two adjacent cells of the ordered set lie either in the same row or in the same column, and
 - No three or more adjacent cells in the ordered set lie in the same row or column. The first cell of the set must follow the last in the set, that is, each cell (except the last cell) must appear only once in the ordered set
- Remarks:
 - 1. Every loop has an even number of cells and at least four
 - 2. The allocations are said to be in independent position if it is not possible to increase or decrease any independent individual allocation without changing the positions of these allocations, or violating the rim conditions, a closed loop cannot be formed through these allocations
 - 3. Each row and column in the transportation table should have only one plus and minus sign, all cells that have a plus or minus sign, except the starting unoccupied cell, must be occupied cells
 - 4. Closed loops may or may not be square in shape
- There are several methods available to obtain an initial solution. Here we shall discuss the **North West Corner Method (NWCM:**

It is a simple and an efficient method to obtain an initial solution. This method does not take into account the cost of transportation on any route of transportation