Frequently Asked Questions

1. When is the optimality checked?

Answer:

When the initial basic feasible solution is calculated the next step is to check the optimality.

2. What is an optimal solution?

Answer:

An optimal solution is one in which there is no opportunity cost. That is there is no other set of transportation routes (allocation) that will reduce the total transportation cost.

3. How do we check the optimal solution?

Answer:

We have to evaluate each unoccupied cell (represent unused route) in the transportation table in terms of opportunity cost to check the optimal solution.

4. What is incoming variable?

Answer:

The unoccupied cell with the largest negative opportunity cost is selected to include in the new set of transportation routes. This is also known as incoming variable.

5. What is an outgoing variable?

Answer:

The outgoing variable in the current solution is the occupied cell (basic variable) in the unique closed path (loop) whose allocation will become zero first as more units are allocated to the unoccupied cell with the largest negative opportunity cost.

6. What is the other name for U-V method?

Answer:

An efficient technique called the modified distribution (MODI) method also called as the u-v method.

7. What is the use of MODI method?

Answer:

The modified distribution (MODI) method helps in comparing the relative advantage of alternative allocations for all unoccupied cells simultaneously.

8. What is the concept on which the MODI method is based?

Answer:

The MODI method is based on the concept of duality.

9. What is the concept of duality?

Answer:

For a basic feasible solution if we associate numbers (also called dual variables or multipliers) u_i and v_j with row i (I equal to 1, 2, 3....,m) and column j (j equal to 1, 2, 33,, n) of the transportation table respectively, then u_i and v_j must satisfy the equation $u_i + v_j = c_{ij}$ for each occupied cell (i,j).

10. How are the values of the variables determined?

Answer:

The values of these variables can be determined from the above relationship by assigning arbitrarily zero value to any one of these variables and then the value is of the remaining m plus n minus 1 variable can be obtained algebraically.

11. How do we evaluate the unoccupied cell?

Answer:

Once the values u_i and v_j have been determined, evaluation in terms of opportunity cost of each unoccupied cell called non basic variable or unused route is done using the equation: $d_{rs} = c_{rs} - (u_r + v_s)$ for each unoccupied cell (r,s).

12. What is a location rent?

Answer:

The value of each variable u_i measure the comparative advantage of either the location or the value of a unit of capacity at the supply center i and, therefore, may be termed as location rent.

13. What is a market price?

Answer:

The value of each variable v_j measures the comparative advantage of an additional unit of commodity transported to demand centre j and, therefore, may be termed as market price.

14. How do we decide the optimality of the current feasible solution?

Answer:

- i. If $d_{ij} > 0$, then the current basic feasible solution is optimal
- ii. If $d_{ij} = 0$, then the current basic feasible solution will remain unaffected but an alternative solution exists
- iii. If one or more $d_{ij} < 0$, then an improved solution can be obtained by entering unoccupied cell (i,j) in the basis
- 15. How do we decide to select the unoccupied cell?

Answer:

An unoccupied cell having the largest negative value of d_{ij} is chosen for entering into the solution mix and then a closed loop path is constructed.