PRESENTATION ON SPECIAL ISSUE OF ASSIGNMENT MODEL

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NTRODUCTION TO ASSIGNMENT PROBLEM

- An assignment problem is a particular case of transportation problems.
- The objective is to assign a number of resources to an equal number of activities .
- So as to minimize total cost or maximize total profit of allocation.
- The problem of assignment arises because of available resources such as men, machines etc.
- varying degrees of efficiency for performing different activities, therefore, cost, profit or loss of performing the different activities is different

Outline of presentation

- Introduction to assignment problem
  - Matrix form of assignment problem
- Un balanced row and column(resource and jobs)
- Alternative optimal solution
- Prohibited assignment
- Maximization case

MATRIX FORM OF ASSIGNMENT PROBLEM

- The assignment problem can be stated that in the form of mxn matrix c_{ij} called a Cost Matrix (or) Effectiveness Matrix where c_{ij} is the cost of assigning i^{th} machine to j^{th} job.

$$\begin{bmatrix} c_{11} & c_{12} & \cdots & c_{1n} \\ c_{21} & c_{22} & \cdots & c_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ c_{m1} & c_{m2} & \cdots & c_{mn} \end{bmatrix}$$

UN BALANCED ROW AND COLUMN(RESOURCE AND JOBS)

- Often the number of people or objects to be assigned does not equal the number of tasks or clients or machines listed in columns, and the problem is ***unbalanced***.
- When this occurs, and there are more rows than columns, simply add a ***dummy column or task.***
- If the number of tasks exceeds the number of people available, we add a dummy row.
- Since the dummy task or person is non existent ,we enter zeros in its row or column as the task or time estimate

ALTERNATIVE OPTIMAL SOLUTION

- Its is possible for transportation problem to have multiple optimal solutions.
- This happens when one or more of improvement indices is zero in the optimal solution.
  - This means its possible to deign alternative shipping routes with the same total shipping cost.
  - The alternate optimal solution can be found by shipping the most to this unused square using a stepping –stone path
- In the world ,alternate optimal solutions provide management with greater flexibility in selecting and using resources

PROHIBITED ASSIGNMENT

- Al times there are transportation problems in the which one of sources is unable to ship to one or more of destinations
  - The problem is said to have un acceptable or **prohibited route**
- In minimization problem ,such prohibited route is assigned a very high cost to prevent this solution.
- In maximization problem the very high cost used in minimization problems is given a negative sign ,turning it into very bad profit

MAXIMIZATION CASE

- If the objective of the transportation problem is to maximize profit a minor change is required in the transportation algorithm.
- Now the optimal solution is reached when all the improvement indices are negative or zero.
- The cell with the largest positive improvement index is selected to be filled using stepping stone path.
- This new solution is evaluated and process continues until there are no positive improvement indices

THANK YOU