Part-2

Q:- Define Branch and Bound :- core principles:-

A Branch and Bound algorithm is a state space search algorithm, which is used for Optimisation problems (find best solutions).

Core Principles:-

1. Branching :- This method involves dividing a problem into smaller sub-problems in a systematic way.

Branching splits the problem into smaller, more manageable sub-problems.

2. Bounding :- Bounding evaluates and eliminates (delete), those that cannot provide the best solution.

3. Selection :- This step involves choosing one sub problem at a time for further exploration. The choice is based on the best estimated cost.

Q:- Travelling salesperson problem :- Rules :-

In Travelling salesman problem, A sales person will be travelling to different cities and he will be selling the product or he will be advertising about the product by **follow some rules**.

1. Visit each city atleast once.
2. Do not visit any city more than once.
3. starting city and ending city should be same.

$$A = A, B, C, D \longrightarrow A-B-C-D-A.$$
$$\searrow A-D-C-B-A.$$
$$A-C-D-B-A.$$

Q:- Define Row Reduction and Column Reduction Matrix ?

Row/Column Reduction Matrix :- In Row/Column Reduction Matrix find out least element in each and every row, then substract all elements with least element.

$$Ex:- R_1 = [\infty \quad 10 \quad 5 \quad 3] \Rightarrow 3 L.C$$

$$Col :- \begin{bmatrix} \infty \\ 8 \\ 1 \end{bmatrix} \Rightarrow \begin{bmatrix} \infty \\ 7 \\ 0 \end{bmatrix} \begin{matrix} 8-1=07. \\ 1-1=0 \end{matrix}$$

$$\begin{bmatrix} \infty & \infty & 10-3 & 5-3 & 3-3 \\ \infty & 7 & 2 & 0 \end{bmatrix}$$

0/1-Knapsack problem :— 2 application

1. L.C (Least count)
2. FIFO (First-in-First-out).

Knapsack is a Bag/container, to place the objects into Knapsack so that the profit is maximum.

$$\text{number of objects} = n$$
$$\text{profit} = P_i$$
$$\text{weight} = w_i$$
$$\text{Capacity} = M$$

Q:— Define Lower Bound & Upper Bound ?

Lower Bound :— fraction Values are allowed.

$$\frac{1}{2} \checkmark$$

Upper Bound :— fraction Values are not allowed.

$$\frac{1}{2} \times$$

$$\times === \times === \times ===$$

still here My Topics