unacademy

Greedy Techniques - Part X

Complete Course on Algorithms - GATE

Subbarao Lingamgunta • Lesson 43 • May 11, 2023

Greedy Technic

Note: Most of the problems in Greedy contain n-i/p's and our objective is finding a subset which will satisfy our conditions & maximized our goal.

Solution Space

Feasible Solution

G_1 G_2 G_3 . . . . G_{50}

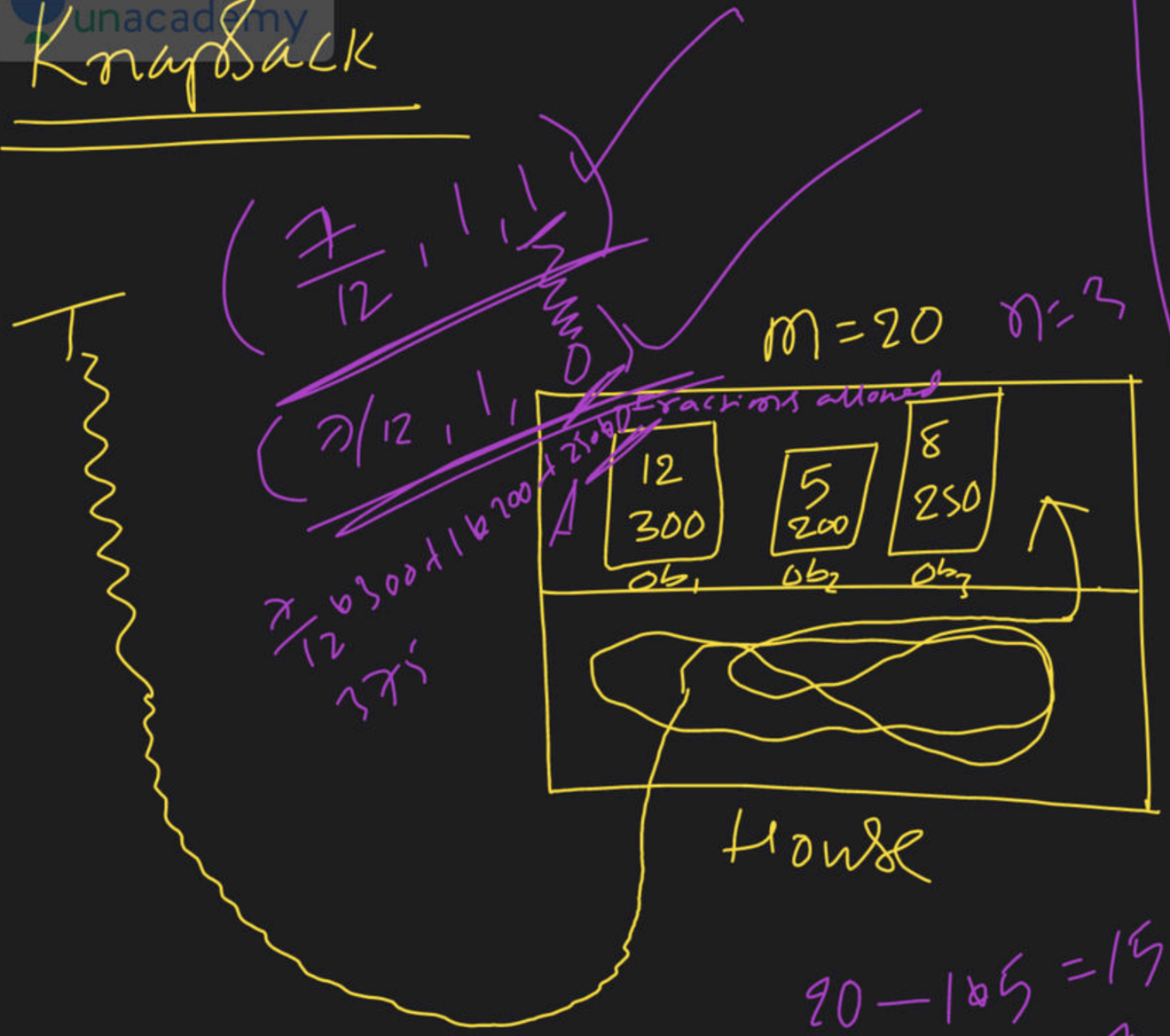
Optimal Solution

G_3

Applications of GT

1. Knapsack problem
2. Job sequencing with deadlines
3. Huffman Coding
4. Optimal Merge Patterns
5. Minimum cost spanning tree (MST)
   (i) prims (ii) kruskal
6. Single source shortest path (SSSP)
   - Dijkstra's algo
   - Bellman-Ford
   - BFT

Knapsack



7/12 of 300 + 1 of 200 + 1 of 250

7 items

Ob_1: 12 —— 300 ③

1 —— $\frac{300}{12}$ = 25

Ob_2: $\frac{200}{5}$ = 40 ①

Ob_3: $\frac{250}{8}$ = 31.5 ②

$\left(\frac{7/12}{x_1} \quad \frac{1}{x_2} \quad \frac{1}{x_3}\right)$

$\frac{7}{12}$ of 300 + 1 of 200 + 1 of 250 = 625

maximum profit

20 − 15 = 5

5 − 1 = 4

4 − $\frac{4}{12}$ of 12 = 0

$n = 7$ $\quad m = 27$

Objects :	ob_1	ob_2	ob_3	ob_4	ob_5	ob_6	ob_7
profit :	100	35	150	320	140	80	90
weight :	4	2	7	10	6	2	3