Knapsack Problem - Greedy Approach :

Reference : YT - ABDUL BARI - KNAPSACK
Notes prepared by : M.Mirthula

Objects	**o**	1	2	3	4	5	6	7
Profits	**p**	10	5	15	7	6	18	3
Weights	**w**	2	3	5	7	1	4	1

n = 7
m =15

Fill objects in a container/Knapsack/bag of weight 15kg and transfer it.

Constraint :

- The total weight of objects to be put in the knapsack should be less than or equal to 15 here.
- ∑xiwi <=m
- Max ∑xipi → Profit should be maximized.
- Objection selection is based on determining ratio = Profit/weight

Step 1: Determine the ratio

Objects	**o**	1	2	3	4	5	6	7
Profits	**p**	10	5	15	7	6	18	3
Weights	**w**	2	3	5	7	1	4	1
Ratio	**p/w**	5	1.3	3	1	6	4.5	3

Step 2 : Sort in Descending order

Objects	**o**	5	1	6	7	3	2	4
Profits	**p**	6	10	18	3	15	5	7
Weights	**w**	1	2	4	1	5	3	7
Ratio	**p/w**	6	5	4.5	3	3	1.6	1

Step 3 : Determine Total Profit and weight :

[From object 2 we are only taking 2kg's of weight to reach maximum of 15kg to be placed in bag]

Total weight : 1+2+4+1+5+3*⅔ = 15

Total Profit : 6+10+18+3+15+5*⅔ = 55.33