Knapsack Problem

7(n) Objects: 0 1 2 3 4 5 6 7

15(m) profits: P 10 5 15 7 6 18 3

weights: w 2 3 5 7 1 4 1

$\frac{P}{w}$	5	1·3	3	1	6	4·5	3

x (1 $\frac{2}{3}$ 1 0 1 1 1)

x_1 x_2 x_3 x_4 x_5 x_6 x_7

$0 \leq x \leq 1$

15−1=14
14−2=12
12−4=8
8−5=3
3−1=2
2−2=0

$\sum x_i w_i = 1\times2 + \frac{2}{3}\times3 + 1\times5 + 0\times7 + 1\times1 + 1\times4 + 1\times1$

$2 + 2 + 5 + 0 + 1 + 4 + 1 = 15$

$\sum x_i P_i = 1\times10 + \frac{2}{3}\times5 + 1\times15 + 1\times6 + 1\times18 + 1\times3$

$= 10 + 2\times1.3 + 15 + 6 + 18 + 3 = 54.6$

Constraint

$\sum x_i w_i \leq m$

Objective

$\max \sum x_i P_i$