Greedy Method.

1)* Find the optimal sol^n for the knapsack distance $n=7$, $m=15$, and p_1 to p_7 are 10, 5, 15, 7, 6, 18, 3 and their weights are 2, 3, 5, 7, 1, 4, 1.

→ m = knapsack capacity.
P = profit
w = weights.
M = 15
P = {10, 5, 15, 7, 6, 18, 3}
w = {2, 3, 5, 7, 1, 4, 1}

	i_1	i_2	i_3	i_4	i_5	i_6	i_7
$\frac{p_i}{w_i}$ =	$\frac{10}{2}$	$\frac{5}{3}$	$\frac{15}{5}$	$\frac{7}{7}$	$\frac{6}{1}$	$\frac{18}{4}$	$\frac{3}{1}$
$\frac{p_i}{w_i}$ =	5	1.66	3	1	6	4.5	3

Arrange them in decreasing order of their pi/wi ratio.

$\frac{p_i}{w_i}$ = ~~1, 1.66~~ 6 5 4.53 3 1.66 1
i_5 i_1 i_6 i_3 i_7 i_2 i_4

items (X)	wixi	$P_i = P + P_ix_i$
$\{i_1, i_2, i_3, i_4, i_5, i_6, i_7\}$ {0, 0, 0, 0, 1, 0, 0}	15 − 1 = 14	~~6+1~~ = 6
{1, 0, 0, 0, 1, 0, 0}	14 − 2 = 12	6 + 10 = 16.
{1, 0, 0, 0, 1, 1, 0}	12 − 4 = 8	16 + 18 = 34
{1, 0, 1, 0, 1, 1, 0}	8 − 5 = 3	34 + 15 = 49
{1, 0, 1, 0, 1, 1, 1}	3 − 1 = 2	49 + 3 = 52
{1, 1, 1, 0, 1, 1, 1}	$2 - \frac{2}{3} = 0$	$52 + \frac{2}{3} \times 5$
		$= 52 + \frac{10}{3}$
		$= 52 + 3.3$

Profit. $\boxed{= 55.3}$

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(2). $S = \{a, b, c, d, e, f, g)$.
Be a Collection of object with profit weight are Values are follows.

A = 12, 4 E = 14, 3
B = 10, 6 F = 7, 1
C = 8, 5 G = 9, 6
D = 11, 7

what is the optimal solution to the fractional knapsack problem for as. assume the knapsack capacity has the weight is ~~15~~ 18 what is the complexity of this method.

→ $\omega = 15$

$p = \{12, 10, 8, 11, 14, 7, 9\}$
$\omega = \{4, 6, 5, 7, 3, 1, 6\}$

a b c d e f g

$\frac{p}{\omega} = \frac{12}{4}, \frac{10}{6}, \frac{8}{5}, \frac{11}{7}, \frac{14}{3}, \frac{7}{1}, \frac{9}{6}$

= 3, 1.66, 1.6, 1.57, 4.6, 7, 1.5

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Arrange them in decreasing order of their p_i/ω_i ratio.

$\frac{p_i}{\omega_i}$ = 7, 4.6, 3, 1.66, 1.6, 1.57, 1.5
f e a b c d g

items (x_i)	$\omega_i x_i$	$P_i = P + P_i x_i$
{a, b, c, d, e, f, g)	18 − 1	7
{0, 0, 0, 0, 0, 1, 0)	= 17	
{0, 0, 0, 0, 1, 1, 0)	17 − 3 = 14	7 + 14 = 21
{1, 0, 0, 0, 1, 1, 0)	= 14 − 4 = 10	21 + 12 = 33
{1, 1, 0, 0, 1, 1, 0}	= 10 − 6 = 4	33 + 10 = 43
{1, 1, 1, 0, 1, 1, 0}	= $4 - \frac{4}{5} = 0$	$= 43 + \frac{4}{5} \times 8$

$= 43 + \frac{32}{5}$

$= 43 + 6.4$

Profit $\boxed{= 49.4}$

Job Sequencing Problem

①

J3	J2	J4	J5

0 1 2 3 4

profit = $40 + 60 + 100 + 80 = 280$.

Job sequence = {J3, J2, J4, J5}

jobs	J1	J2	J3	J4	J5
Deadlines	2	2	1	3	4
profits	20	60	40	100	80

Maximum deadline = 4

Arrange job in decreasing order of their profit

Jobs	J4	J5	J2	J3	J1
Deadlines	3	4	2	1	2
profit	100	80	60	40	20

② Given the Jobs & deadline associated profits as shown

Jobs	J1	J2	J3	J4	J5	J6
Deadlines	5	3	3	2	4	2
Profits	200	180	190	300	120	100

i) write the optimal schedule that gives the maximum profit ii) are all the jobs Completed in a optimal Schedule and iii) what is the maximum earned profit?

→ Maximum deadline = 5.

Arrange the job in decreasing order of their profit.

jobs	J4	J1	J3	J2	J5	J6
Deadlines	2	5	3	3	4	2
profit	300	200	190	180	120	100

J2	J4	J3	J5	J1

0 1 2 3 4 5

profit = $180 + 300 + 190 + 120 + 200$

$= 990$

1) optimal schedule = {J2, J4, J3, J5, J1}
2) maximum profit = 990
3) all the jobs Completed in optimal Schedule :- NO

(3)

Job	J1	J2	J3	J4	J5	J6	J7	J8	J9
Deadline	7	2	5	3	4	5	2	7	3
profit	15	20	30	18	18	10	23	16	25

→ maximum deadline = 7

Arrange Job in decreasing order of their profit.

Jobs	J3	J9	J7	J2	J4	J5	J8	J1	J6
Deadline	5	3	2	2	3	4	7	7	5
profit	30	25	23	20	18	18	16	15	10

J2	J7	J9	J5	J3	J1	J8	X

0 1 2 3 4 5 6 7

profit = 20 + 23 + 25 + 18 + 30 + 15 + 1
= 147

Job sequence = {J2, J7, J9, J5, J3, J1, J8

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