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Ans. the Q. No: 1

Sort the given activities in ascending order according to their finishing time.

The table after we have sorted it:

i	1	2	3	4	5	6	7	8	9	10
s_i	0	0	2	1	4	3	7	11	12	14
f_i	1	3	6	7	7	8	10	13	14	15
Activity Name	a_6	a_3	a_8	a_2	a_{10}	a_9	a_1	a_5	a_4	a_7

(i) A (0, 0, 0, 10) ——— int

s f k n

Recursive call

$m = 0 + 1 = 1$

$1 \leq 11 \longrightarrow$ True and

$s_m = 0 \not< f_k = 0 \longrightarrow$ False

return $\{a_6\} \cup A(0, 1, 1, 10)$

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(ii) A (0, 1, 1, 10) → 2nd

$m = 1 + 1 = 2$

$2 \leq 10 \rightarrow T$ and

$s_m = 0 < f_k = 1 \rightarrow$ True

$m = 2 + 1 = 3$

$s_m = 2 < f_k = 1 \rightarrow$ False

return $am\{a_6, a_8\} \cup A(2, 6, 3, 10)$

(iii) A (2, 6, 3, 10) → 3rd

$m = 3 + 1 = 4$

$4 \leq 10 \rightarrow T$ and

$s_m = 1 < f_k = 6 \rightarrow T$

$m = 4 + 1 = 5$

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$S_m = 4 \quad < \quad f_k = 6 \rightarrow T$

$m = 5+1 = 6$

$S_m = 3 \quad < \quad f_k = 6 \rightarrow T$

$m = 6+1 = 7$

$S_m = 7 \quad < \quad f_k = 6 \rightarrow F$

return $am\{a_6, a_8, a_1\} \cup A(7, 10, 7, 10)$

(iv) $A(7, 10, 7, 10) \rightarrow$ 4th

$m = 7+1 = 8$

$8 \leq 10 \rightarrow T$ and

$S_m = 11 \quad < \quad f_k = 10 \rightarrow$ False

return $am\{a_6, a_8, a_1, a_5\} \cup A(11, 13, 8, 10)$

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(iv) $A(11, 13, 8, 10) \longrightarrow 5th$

$m = 8+1 = 9$

$9 \leq 10$ and

$s_m = 12 < f_k = 13 \longrightarrow T$

$m = 9+1 = 10$

$s_m = 14 \not< f_k = 13 \longrightarrow$ False

return $a_m (a_6, a_8, a_1, a_5, a_7) \cup$

$A(14, 15, 10, 10)$

(vi) $A(14, 15, 10, 10) \longrightarrow 6th$

$m = 10+1 = 11$

$11 \leq 11 \longrightarrow$ False

return ϕ

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Am. the. Q. NO: 2

Step - 1

O_i	a	b	c	d	e	f	g	h		
P_i	10	7	15	16.5	25	54	14	12		
W_i	1	2.5	3	6	5.4	4	3.6	4		
$u_i = \frac{P_i}{w_i}$	10	2.8	5	2.75	4.63	13.5	3.88	3		

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Step-2

Oi	f	a	c	e	g	h	b	d		
Pi	54	10	15	25	14	12	7	16.5		
Wi	4	1	3	5.4	3.6	4	2.5	6		
$u_i = \frac{P_i}{W_i}$	13.5	10	5	4.63	3.89	3	2.8	2.75		
x_i (1)	0	0	0	0	0	0	0	0		
x_i (2)	1	0	0	0	0	0	0	0		
x_i (3)	1	1	0	0	0	0	0	0		
x_i (4)	1	1	1	0	0	0	0	0		
x_i (5)	1	1	1	3/5.4	0	0	0	0		

Total capacity

m = 11,

Rest capacity,

→ U = 11 − 0

= 11 − 0

U = 11 − 4 = 7

U = 7 − 1 = 6

U = 6 − 3 = 3

$U = 3 - \left(5.4 \times \frac{3}{5.4}\right)$

= 3 − 3 = 0

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Maximum Profit = $\sum p_i x_i$

$= (54 \times 1) + (10 \times 1) + (15 \times 1) + (25 \times 0.55)$

$+ (14 \times 0) + (12 \times 0) + (7 \times 0) + (16.5 \times 0)$

$= 92.75$

Total weight = $\sum w_i x_i$

$= (4 \times 1) + (1 \times 1) + (3 \times 1) + (5.4 \times 0.55)$

$+ (3.6 \times 0) + (4 \times 0) + (2.5 \times 0) + (6 \times 0)$

$= 11$

Fraction taken of the items:

$(x_a, x_b, x_c, x_d, x_e, x_f, x_g, x_h)$

$= (1, 0, 1, 0, 0.55, 1, 0, 0)$

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Ans. the. Q.No : 3

Advantages of greedy Algorithm:

(i) They are easier to implement

(ii) They require much less computing resources.

(iii) They are much faster to execute.

(iv) Greedy algorithms are used to solve optimization problems.

Disadvantages:

(i) Their only disadvantage being

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that they not always reach the ~~got~~ global optimum solution.

(ii) On the other hand, even when the global optimum solution is not reached, most of the times the reached sub-optimum solution is a very good solution.