Class 20

Tuesday, March 30, 2021 8:00 PM

Greedy Technique

$N_{C_3} \approx N^3$

Array, N, 3, sum, সর্বোচ্চ

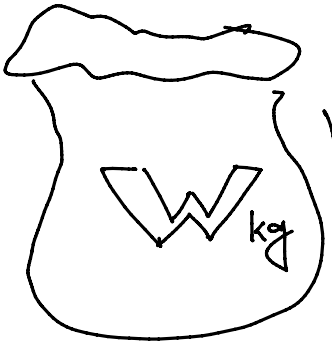
$\sum w \le W$

$\sum v$ is maximized

↳ $\sum v$

Fractional Knapsack

	P_1	P_2	P_3	P_4
value :	20	30	25	30
weight :	10	20	10	15
value/weight :	2	1.5	2.5	2



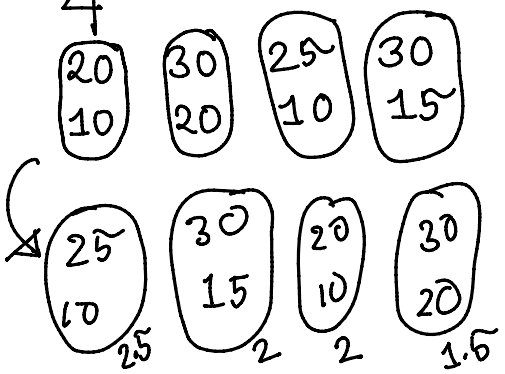
W = ~~27~~ ~~17~~ ~~2~~ 0

V = 25$ + 30$ + 4$

= 59$

27

4



59

* sort the array

cmp(a, b)

{ u_1 = a.first / a.second

u_2 = b.first / b.second

if($u_1 > u_2$) return true;

} return false

~~30/15~~, ~~30/10~~

cmp(30/15, 30/10)

$u_1 > u_2$

$\Rightarrow \frac{a.first}{a.second} > \frac{b.first}{b.second}$

$\Rightarrow$ a.first × b.second > b.first × a.second

—o—

A)

$N = a^2 + b^2 \Rightarrow N - a^2 = b^2$

$N = 34$

$N - a^2 = 34 - 1^2 = 33 \times$ ($\sqrt{N}$, $\sqrt{N}$)

$34 - 2^2 = 30 \times$

$34 - 3^2 = 25 \checkmark = 5^2$

$34 = 3^2 + 5^2$

for (a=1 ; a≤√N ; a++)

{ exp = $N - a^2$

}

$O(\sqrt{N})$

— o —

$1 \sim 10^5$ | $N \log N$

$(2a+1)(2b+1)(2c+1)\ldots$

$5 \rightarrow 25$

$K \leq 1100 \sim 1200$

$K = 3$

$K = 5$

$(2a+1)K = 7$

$6 = (2+1) \times (1+1)$

$12 \rightarrow 144$

$12 = 2^2 \times 3^1$

$144 = (12)^2 = (2^2 \times 3^1)^2 = 2^{2 \cdot 2} \times 3^{1 \cdot 2}$