CSL 356 lectru 19 Sept 12

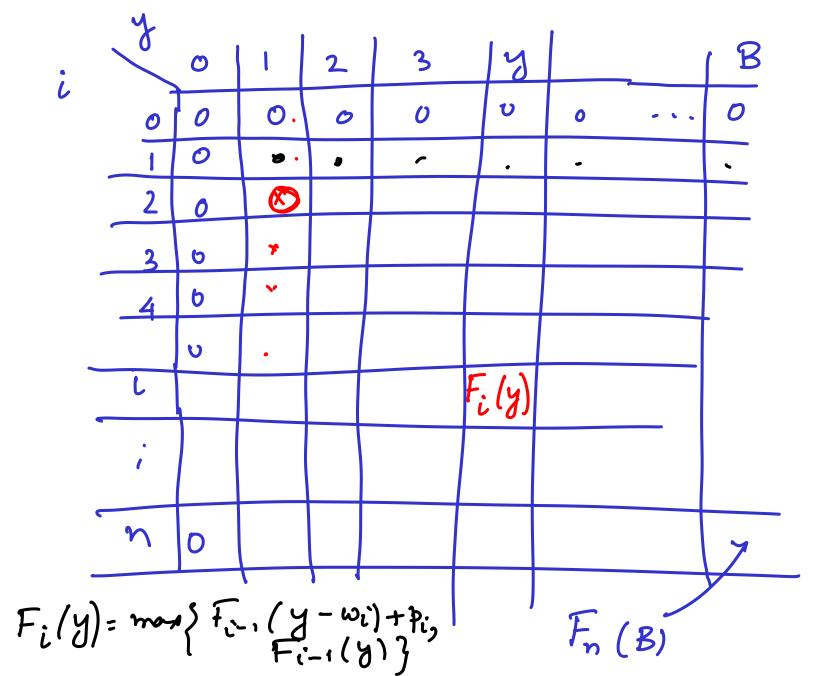
Knapsack problem revisted

Capacity = B

weight ω_i , $\omega_2 - ... \omega_n$ profits β_i β_2 ... β_n Max $\sum z_i \cdot \beta_i$ s.t. $\sum z_i \omega_i \in B$ $\sum_{\alpha_i} \omega_i \leq B$ $\sum_{\alpha_i} \omega_i \leq B$ $\sum_{\alpha_i} z_i \in \{0, 1\}$

Define $F_i(y)$: the mann profit 0 < y < B, |si < n| problem restricted t. items 1, 2, ... i and capacity y. Then our objective is to compute $F_n(B)$

Fi (y) = max { Fi-1 (y-wi) + pi, $F_{i-1}(y)$ map profit including the im object mes profit not including It is a recurrence which implies - that If we have "precomputed" the tono terms on the R+15, with addition O(1) computation, we can compute Fi(y) Fi-1 (y-wi) Fi-1 (y) $F_i(0) = 0$ Fo (7) is -ap for i,j < 0 $F_{i}(j)$



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What is -the -time complexity of this process of filling up trole? the O (n.B) total # entres in table x O(1) for flying each entry Input Size description of n ; tems P1 2 -- pn w1 w2 .- wn | PI, | WI & B N=2b.n + log_B (13 ts)

 $B \le n^3$, suppose then polynomial b = 3 N = 6n + n = 7n $log_1 B = n$

-> Dynami & Programming

-> Pseudo polynamial time

algerithm

(it is polynamial in same parameters

but not all)