

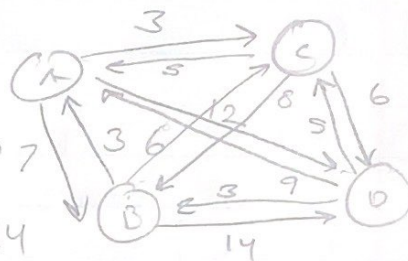
Homework 18

1) A B C D

A	B	C	D
∞	7	(3)	12
(3)	∞	6	14
(5)	8	∞	6
9	(3)	5	∞

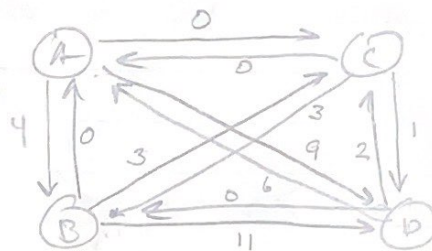
Initial Rough Band

$$3+3+3+5=14$$



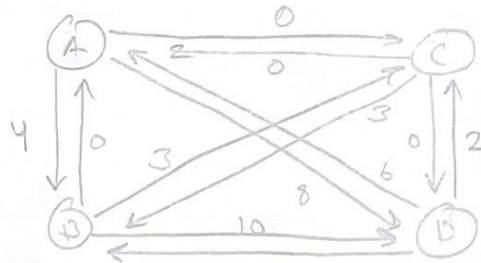
Reduce Rows

A	B	C	D
∞	4	0	9
0	∞	3	11
0	3	∞	(1)
6	0	2	∞



Reduce Columns

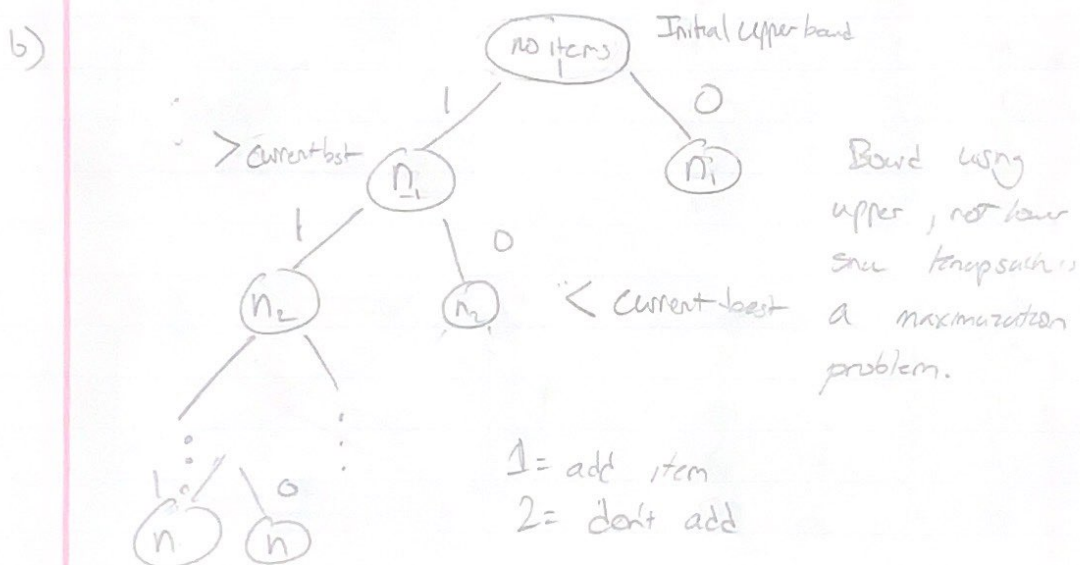
A	B	C	D
∞	4	0	8
0	∞	3	10
0	3	∞	0
6	0	2	∞



Final band $14+1=15$

2) 0/1 Knapsack with n items & capacity W

a) For an 0/1 knapsack problem with n items, It will generate 2^n solutions when solved brute force, hence the $O(2^n)$ time complexity. Many solutions will be invalid of the 2^n .



c) Upper bound(n , value, weight, W) n =items, W =capacity
 for all item in set of items considered to add, skip item if not included (0 branch)
 totalvalue += item.value, totalweight += item.weight
 for all item in set of items not added yet to knapsack
 totalweight += item.weight
 if totalweight > W (ignore items that would exceed limit W).
 totalweight -= item.weight
 continue to next item
 else totalweight += item.weight, totalvalue += item.value
 return totalvalue
 * Return best estimate of possible values based on current state (weight & value)