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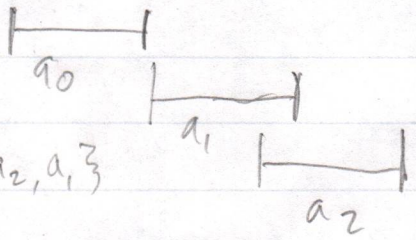
mid term 2

Q1 1) compatible activity with latest start time

assume there is an optimal solution in S_{oi} ($o_i \in OPT$)

$S\{a_0, a_1, a_2\}$

$S_{a_0} = \{a_1, a_2\}$



pick $i=0$, $S_{a_0} = \{a_2, a_1\}$

$OPT - \{a_0\} = \{a_2\}$

Proof by Contradiction (need to prove B is an optimal sol

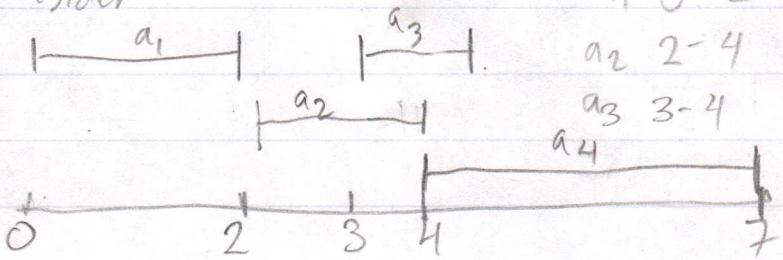
$|B'| > |B|$ $\quad o_i \notin S_{oi}$ $\quad B' > B$

$|B' + \{o_i\}| > |B + \{o_i\}| \rightarrow B' \subseteq S_{oi}$ but B is OPT

2) Consider $\quad a_1\ 0-2 \quad a_4\ 4-7$

$a_2\ 2-4$

$a_3\ 3-4$



not all compatible, disard a_4

greedy sol $\{a_3\}$ $\quad OPT\ \{a_1, a_2, a_4\}$

a_4 discarded then $a_1 \rightarrow$ then a_2

Q2 1) Largest = 10 second largest = 9

2) i) [10, 5]

ii) [9, 8]

iii) Compare largest A_1 with 2nd A_2 &
Largest A_2 with 2nd A_1
Save values of both conditionals &
Compare both updated values

3) max val (A[0...n-1])

lenarr = len(A[i...n-1])

if i = len(A[i...n-1]) #when end of arr
return i

array [0 1 2 3...]
i j

else

Temp1 = maxVal((i...lenarr)/2)

Temp2 = maxVal(~~lenarr+1...~~
((i+j)/2 + 1 ... lenarr)

Min

if A[temp1] ≥ A[temp2]
return A[temp1]
else return A[temp2]

Q3

value

$v = [1, 10, 15, 20]$

$W = [1, 2, 3, 4]$

weight

capacity

$j \leq 5$

$i \leq 4$ items

obj \	0	1	2	3	4	5
0	0	0	0	0	0	0
1	0	1	1	1	1	1
2	0	1	10	11	11	11
3	0	1	10	15	16	25
4	0	1	10	15	20	21

$r = 25$