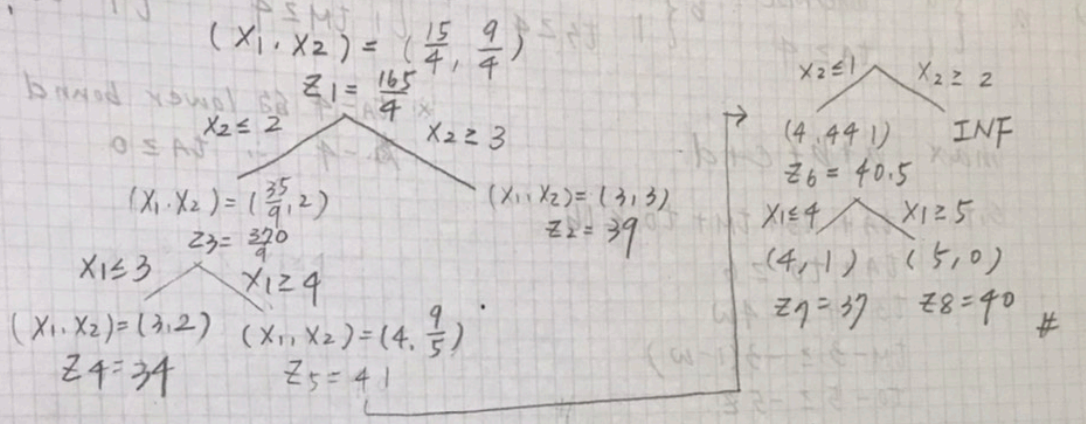
Lecture 7 homework

3.



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8.

Time study in Algo. t_A
Time study in Stat. t_S
Time study in MIS t_M
Time study in OS t_O

$$w \begin{cases} 0, & \text{if } t_S \ge 4 \text{ is satisfied} \\ 1, & \text{if } t_M \ge 3 \text{ is satisfied} \end{cases}$$

$$z \begin{cases} 0 & \text{if } t_O \ge 5 \text{ is satisfied} \\ 1 & \text{if } t_S + t_M \ge 8 \text{ is satisfied} \end{cases}$$

(a) $\min \quad t_A + t_S + t_M + t_O$

s.t $t_A + t_S + t_M + t_O \le 16$

$t_A + t_O \ge 6$

$t_S - 4 \ge -4w$

$t_M - 3 \ge -3(1-w)$

$t_O - 5 \ge -5z$

$t_S + t_M - 8 \ge -8(1-z)$

$t_A, t_S, t_M, t_O \ge 0$

$w \in \{0, 1\}$

$z \in \{0, 1\}$

(b) $a \begin{cases} 0 & \text{otherwise} \\ 1 & t_A \geq 4 \end{cases}$ $b \begin{cases} 0 & \text{otherwise} \\ 1 & t_S \geq 4 \end{cases}$ $c \begin{cases} 0 & \text{otherwise} \\ 1 & t_M \geq 4 \end{cases}$ $d \begin{cases} 0 & \text{otherwise} \\ 1 & t_O \geq 4 \end{cases}$

※ $t_A - 4$ 的 lower bound 為 -4 ∴ $t_A \geq 0$.

$$\max \quad a+b+c+d$$

s.t.

$$t_A + t_S + t_M + t_O \leq 16$$
$$t_A + t_O \geq 6$$
$$t_S - 4 \geq -4w$$
$$t_M - 3 \geq -3(1-w)$$
$$t_O - 5 \geq -5z$$
$$t_S + t_M - 8 \geq -8(1-z)$$
$$t_A - 4 \geq -4(1-a)$$
$$t_S - 4 \geq -4(1-b)$$
$$t_M - 4 \geq -4(1-c)$$
$$t_O - 4 \geq -4(1-d)$$
$$a, b, c, d \in \{0,1\}$$
$$w \in \{0,1\}$$
$$z \in \{0,1\}$$
$$t_A, t_M, t_S, t_O \geq 0$$