

Homework 11

CMPSC 465

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Problem 1:

I did not work with anyone
I did not consult without anyone my group member
I did not consult any non-class materials

Problem 2:

a)

Assuming $t_j = 1$ when the server is in use and 0 when not in use,

$$\begin{aligned} & \text{maximize} && \sum_{i \in C, j \in S} t_j * c_{ij} \\ & \text{subject to} && \sum_{j \in S} t_j \leq k \\ & && c_{ij} \geq 0 \\ & && t_j \in \{0, 1\} \end{aligned}$$

b)

$$\begin{aligned} & \text{minimize} && yk \\ & \text{subject to} && y \leq c_{ij} \text{ given } \forall i \in C, \forall j \in S \end{aligned}$$

Problem 3:

$$\begin{aligned} & \text{maximize} && 2x_1 + 7x_2 + x_3 \\ & \text{subject to} && x_1 - x_3 = 7 \\ & && 3x_1 + x_2 \geq 24 \\ & && x_2 \geq 0 \\ & && x_3 \geq 0 \end{aligned}$$

$$\text{maximize } (2, 7, 1) \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} \text{ subject to } (1, 0, -1) \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = 7, \quad (3, 1, 0) \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} \geq 24, \quad x_2 \geq 0, \quad x_3 \leq 0$$