QUIZ 1

1) Solve the following problem

$$\min_{\mathbf{x}} 2x_0 + 41x_1 + 14x_2 + 4x_3 + 4x_4 + 24x_5 + 50x_6 + 4x_7 + 5x_8 + 6x_9 + 5x_{10} + 15x_{11}$$

$$s.t. \begin{bmatrix} 2 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 \\ 0 & 1 & 0 & 3 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 1 \\ 0 & 0 & 5 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 2 \\ 1 & 0 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 1 & 0 \end{bmatrix} \mathbf{x} = \begin{bmatrix} 4 \\ 5 \\ 6 \\ 3 \end{bmatrix}$$

$$\mathbf{x} \in \{0,1\}^{12}$$

Also written as

$$\min_{\mathbf{x}} \mathbf{c}^\top \mathbf{x}$$
$$s.t. \mathbf{Ax} = \mathbf{b}$$
$$\mathbf{x} \in \{0,1\}^{12}$$

2) Solve the following problem

$$\min_{\mathbf{x}} \sum_i exp(c_i x_i^2 + x_i^3)$$
$$s.t. \mathbf{Ax} = \mathbf{b}$$
$$\mathbf{x} \in \{0,1\}^{12}$$

3) Solve the following problem

$$\max_{\mathbf{x}} \sum_i log(c_i + x_i)$$
$$s.t. \mathbf{Ax} = \mathbf{b}$$
$$\mathbf{x} \in \{0,1\}^{12}$$