

# COMP 3105 — Fall 2025 — Assignment 1

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**Question 1:** Subquestion b.

1.

$$\underset{1 \times (d+1)}{\mathbf{c}^T} \underset{(d+1) \times 1}{\mathbf{u}} = \delta$$

Since  $\mathbf{u} = \begin{bmatrix} \mathbf{w} \\ \delta \end{bmatrix}$ , we can make all the weights in  $\mathbf{w}$  zero, and just have  $\delta$  in the last entry of  $\mathbf{u}$ .

As such, we can set:

$$\mathbf{c} = \underset{(d+1) \times 1}{\begin{bmatrix} 0 & 0 & 0 & \cdots & 0 & 1 \end{bmatrix}^T}$$

2.

Change the first part of inequality of  $L_\infty$  to:

$$-\delta \leq 0$$

We can break  $G^1 \mathbf{u} \leq 0$  into two parts: