1. Find $A$, $b$ and $c_1 \ldots, c_n$ such that both the linear program

$$\text{Minimize } z = c_1 x_1 + c_2 x_2 + \ldots + c_n x_n$$

subject to

\begin{align*}
Ax &= b, \\
x &\geq 0
\end{align*}

and the linear program

$$\text{Minimize } \xi = -c_1 x_1 - c_2 x_2 - \ldots - c_n x_n$$

subject to

\begin{align*}
Ax &= b, \\
x &\geq 0
\end{align*}

have feasible solutions with arbitrarily small cost. In other words, given your choices for $A$, $b$ and $c_1, \ldots, c_n$, for an arbitrary $M \in \mathbb{R}$ you should be able to find two different vectors $x, x' \geq 0$ such that $Ax = Ax' = b$, and both $c_1 x_1 + c_2 x_2 + \ldots + c_n x_n < M$ and $-c_1 x'_1 - c_2 x'_2 - \ldots - c_n x'_n < M$. 