CECS 551 Quiz 3, Spring 2017, Dr. Ebert

C. If $(\overline{\alpha}^*, \overline{x}^*)$ is the solution to the Lagrange optimization problem $L(\overline{\alpha}, \overline{x})$, then explain in a few sentences why

$$\frac{\partial L(\overline{\alpha}^*, \overline{x}^*)}{\partial \overline{x}} = 0.$$

B. Provide the matrices Q, $\overline{q}$, X, and $\overline{c}$ for the Lagrange dual of the MMC optimization problem, for which the positively classified training vectors are

$$(-1, 1), (2, 2), (3, 2),$$

while the negatively classified training vectors are

$$(-2, -4), (1, -1), \text{ and } (4, -2).$$

A. Let $\phi(x) = x^2 - x$. Suppose ϕ is to be minimized subject to $x \geq 3$. Compute the Lagrangian $L(\alpha, x)$ and Lagrange dual $\phi'(\alpha)$ of this optimization problem, and solve the optimization problem by maximizing ϕ'.