

$$\frac{w^T H H^T w}{\partial w} = 2w^T H H^T \quad (1)$$

$$\frac{-2y^T H^T w}{\partial w} = -2y^T H^T \quad (2)$$

$$\frac{\partial y y^T y + w^T H^T H w - 2y^T H^T w}{\partial w} = 0 \quad (3)$$

$$w^T H H^T = y^T H^T$$

$$w^T = y^T H^T (H H^T)^{-1}$$

$$w = ((H H^T)^{-1})^T (y^T H^T)^T$$

$$w = (H H^T)^{-1} H y$$

instead of

$$w = (H H^T)^{-1} H y^T$$