CSE584 HOMEWORK

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1. Generalized LASSO

$$\min_x \frac{1}{2}\|Ax-b\|_2^2 + \lambda\|Fx\|_1$$

Using ADMM:

$$\min_x \frac{1}{2}\|Ax-b\|_2^2 + \lambda\|z\|_1$$
$$\text{subject to } Fx - z = 0$$

So the updating in ADMM algorithm is

$$x^{k+1} = (A_T A + \rho F^T F)^{-1}(A^T b + \rho F^T(z^k - u^k))$$
$$z^{k+1} = S_{\lambda/\rho}(Fx^{k+1} + u^k)$$
$$u^{k+1} = u^k + Fx^{k+1} - z^{k+1}$$