

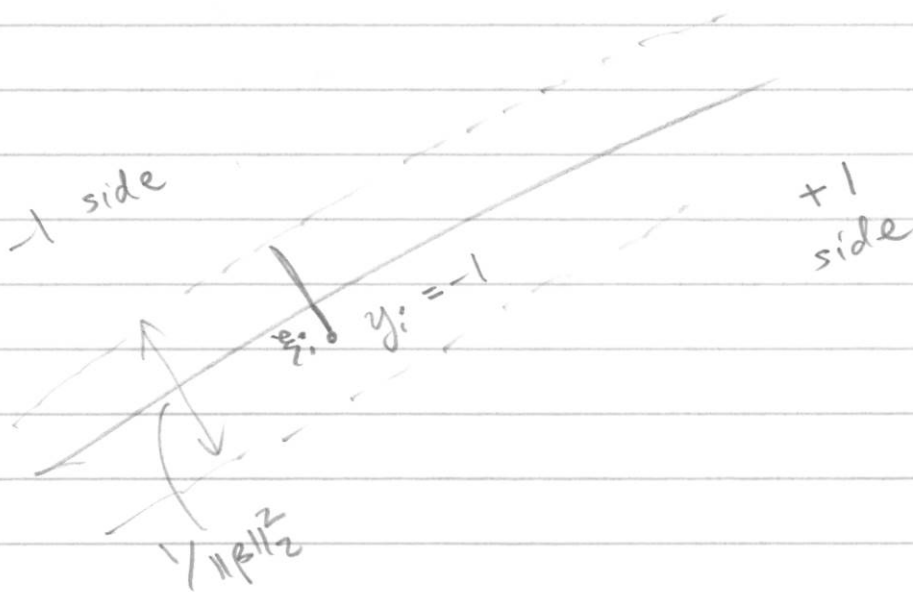
A diag dom means:

$$A_{ii} \geq \sum_{j \neq i} |A_{ij}|$$

$$f(\beta) = \|y - X\beta\|_2^2$$

$$g(\beta) = \|\beta\|_1 - c$$

$$\nabla^2 f(\beta) = 2 X^T X \succ 0$$



$$\nabla f(x)^T (y-x) \geq 0 \quad \text{all } y: Ay=b$$

$$\Rightarrow \nabla f(x)^T v \geq 0 \quad \text{all } v \in \text{null}(A)$$

$\underbrace{\quad}_{v}$

$$\Rightarrow \nabla f(x)^T v = 0 \quad \text{all } v \in \text{null}(A)$$

$$\Rightarrow \nabla f(x) \in \text{row}(A)$$

$$\nabla f(x) = -A^T u \quad \text{some } u$$

$$[x]_+ = \max\{0, x\}$$

$$Ax=b$$

$$\text{solutions: } A^+b + \text{null}(A)$$

$$\textcircled{A^+b + My} \quad \text{particular}$$