Lec6. HW1

- $\alpha_i(y_i w^T x_i - 1 + \xi_i) = 0$
- $\beta_i \xi_i = 0$

1. $\alpha_i = 0 \Rightarrow y_i w^T x_i \geq 1$

$\alpha_i = 0 \Rightarrow \beta_i = C$

$\Rightarrow \xi_i = 0$

$\Rightarrow y_i w^T x_i - 1 \geq 0$

2. $0 < \alpha_i < C \Rightarrow y_i w^T x_i = 1$

$0 < \alpha_i < C \Rightarrow y_i w^T x_i - 1 + \xi_i = 0,\ \beta_i > 0$

$\Rightarrow y_i w^T x_i - 1 + \xi_i = 0,\ \xi_i = 0$

$\Rightarrow y_i w^T x_i - 1 = 0$

3. $\alpha_i = C \Rightarrow y_i w^T x_i \leq 1$

$\alpha_i = C \Rightarrow y_i w^T x_i - 1 + \xi_i = 0$

$\Leftarrow y_i w^T x_i = 1 - \xi_i$

$\Rightarrow y_i w^T x_i \leq 1$

4. $y_i w^T x_i > 1 \Rightarrow \alpha_i = 0$

$y_i w^T x_i > 1 \Rightarrow y_i w^T x_i - 1 + \xi_i \geq y_i w^T x_i - 1 > 0$

$\Rightarrow \alpha_i = 0 \quad \because \alpha_i(y_i w^T x_i - 1 + \xi_i) = 0$

5. $y_i w^T x_i < 1 \Rightarrow \alpha_i = C$

$y_i w^T x_i < 1 \Rightarrow 0 \leq y_i w^T x_i - 1 + \xi_i < \xi_i$

$\Rightarrow 0 \neq \xi_i$

$\Rightarrow \beta_i = 0$

$\Rightarrow \alpha_i = C$

48-196406 [illegible]