

20/9/10/05

$$\prod_{m=1}^3 \prod_{n=1}^2 (m+2n) = \prod_{m=1}^3 \left(\prod_{n=1}^2 (m+2n) \right)$$

$$= \prod_{m=1}^3 ((m+2 \cdot 1) \cdot (m+2 \cdot 2))$$

$$= ((1+2 \cdot 1) \cdot (1+2 \cdot 2)) \cdot ((2+2 \cdot 1) \cdot (2+2 \cdot 2)) \cdot ((3+2 \cdot 1) \cdot (3+2 \cdot 2))$$

$$= 15 \times 24 \times 35 = 12600$$

Practice

$$(1) \sum_{i=1}^3 \sum_{j=1}^3 a_i a_j y_i y_j x_i x_j$$

Support Vector

$$= \sum_{i=1}^3 \left(\sum_{j=1}^3 (a_i a_j y_i y_j x_i x_j) \right)$$

$$= \sum_{i=1}^3 ((a_i a_1 y_i y_1 x_i x_1) + (a_i a_2 y_i y_2 x_i x_2) + (a_i a_3 y_i y_3 x_i x_3))$$

$$= ((a_1 a_1 y_1 y_1 x_1 x_1) + (a_1 a_2 y_1 y_2 x_1 x_2) + (a_1 a_3 y_1 y_3 x_1 x_3)) +$$

$$((a_2 a_1 y_2 y_1 x_2 x_1) + (a_2 a_2 y_2 y_2 x_2 x_2) + (a_2 a_3 y_2 y_3 x_2 x_3)) +$$

$$((a_3 a_1 y_3 y_1 x_3 x_1) + (a_3 a_2 y_3 y_2 x_3 x_2) + (a_3 a_3 y_3 y_3 x_3 x_3))$$

(2) Singular value decomposition

$$\sum_{k=1}^3 \sum_{i=1}^3 \sigma_i^2 (v_i w_k)^2$$

$$= \sum_{k=1}^3 \left(\sum_{i=1}^3 (\sigma_i^2 (v_i w_k)^2) \right)$$

$$= \sum_{k=1}^3 ((\sigma_1^2 (v_1 w_k)^2) + (\sigma_2^2 (v_2 w_k)^2) + (\sigma_3^2 (v_3 w_k)^2))$$

$$= (((\sigma_1^2 (v_1 w_1)^2) + (\sigma_2^2 (v_2 w_1)^2) + (\sigma_3^2 (v_3 w_1)^2))) +$$

$$((\sigma_1^2 (v_1 w_2)^2) + (\sigma_2^2 (v_2 w_2)^2) + (\sigma_3^2 (v_3 w_2)^2))) +$$

$$((\sigma_1^2 (v_1 w_3)^2) + (\sigma_2^2 (v_2 w_3)^2) + (\sigma_3^2 (v_3 w_3)^2)))$$