Machine Learning

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Exercise 1

(a) $a = \frac{-w_1}{w_2}$

(b) $b = \frac{-w_0}{w_2}$

Exercise 2

(a) $E(w) = \frac{1}{n}\sum_{1}^{n} \frac{1}{1+e^{-y_n w^T x_n}}(-y_n x_n e^{-y_n w^T x_n})$

(b) sigmoid is a monotonic function

(c) boundary is still linear

(d) monotonic

Exercise 3

$XW = X_1 y_1^T + ... + X_n y_n^T XW = \sum_1^n X_i y_i^T$

Exercise 4

$(a) w^{\cdot} = \frac{1}{\sigma^2} \sum_1^n x_i^T (y_i - x_i^T w)$

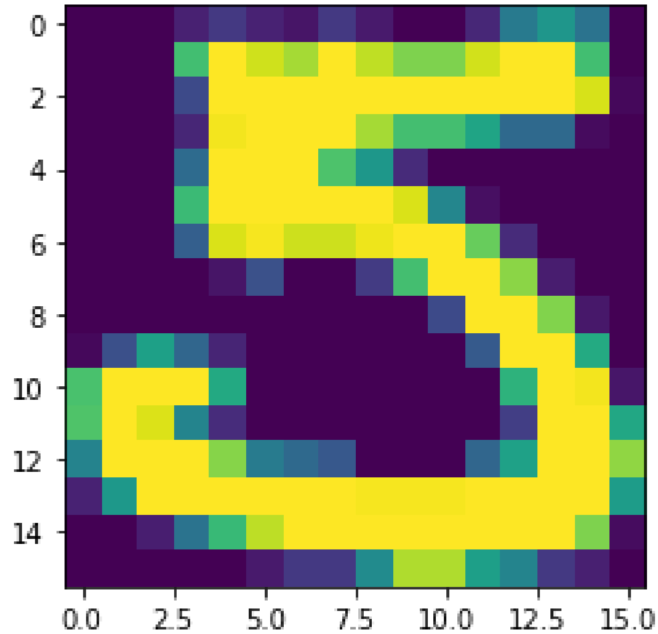
$\sigma^{\cdot} = \frac{1}{\sigma^3} \sum_1^n (y_i - x_i^T w)^2 - \frac{n}{\sigma}$

(b) σ optimization looks like RSS

Exercise 5

when C =2, it can be reduced to the softmax function will become sigmoid function

Exercise 6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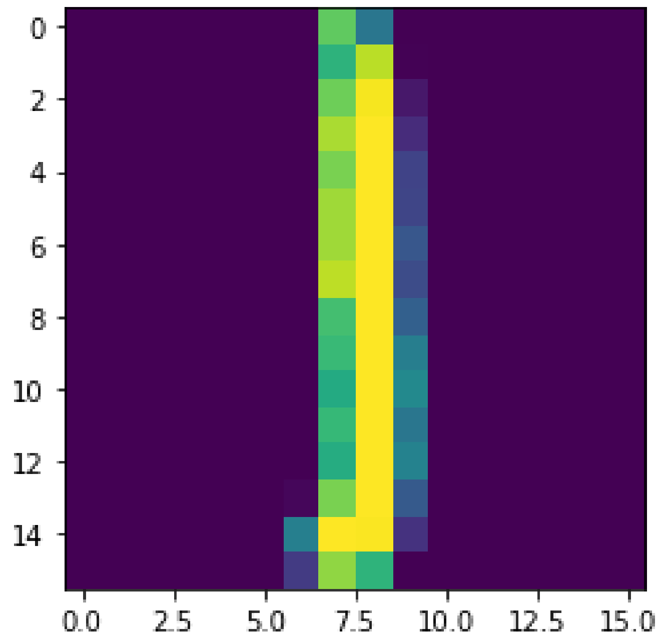
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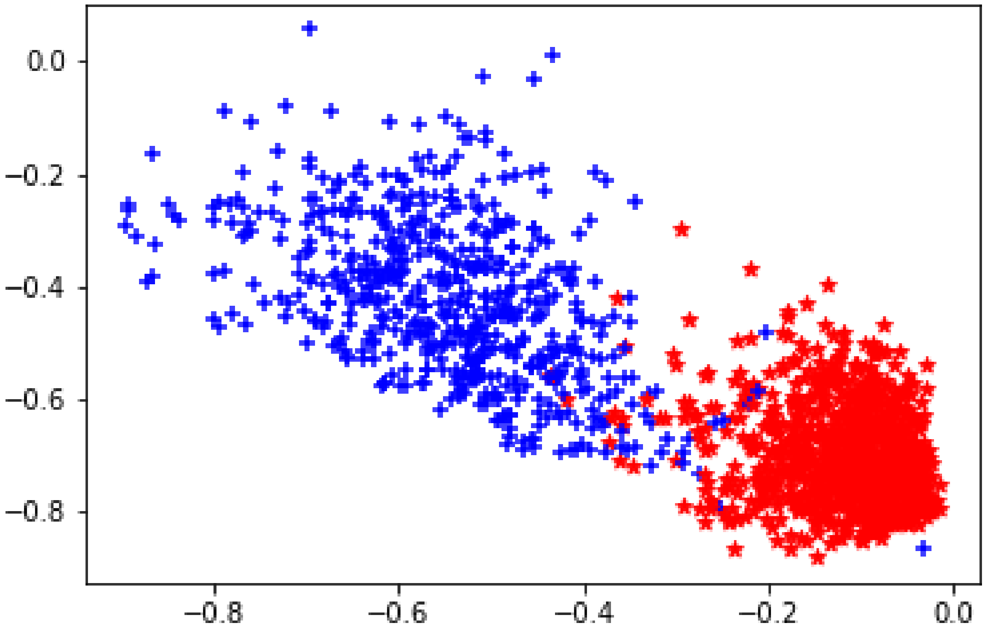
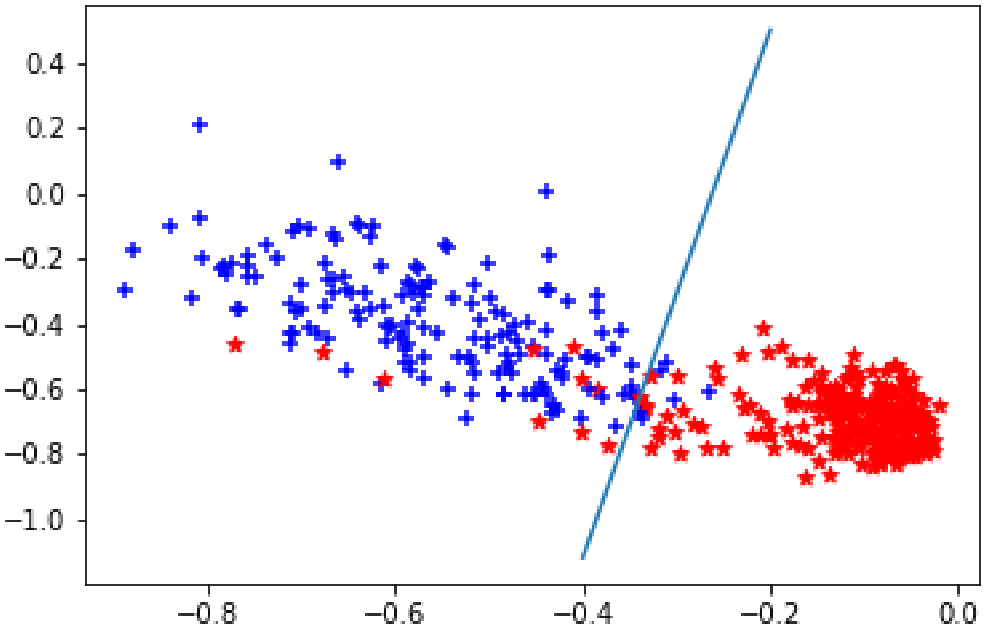


(b)



(d)