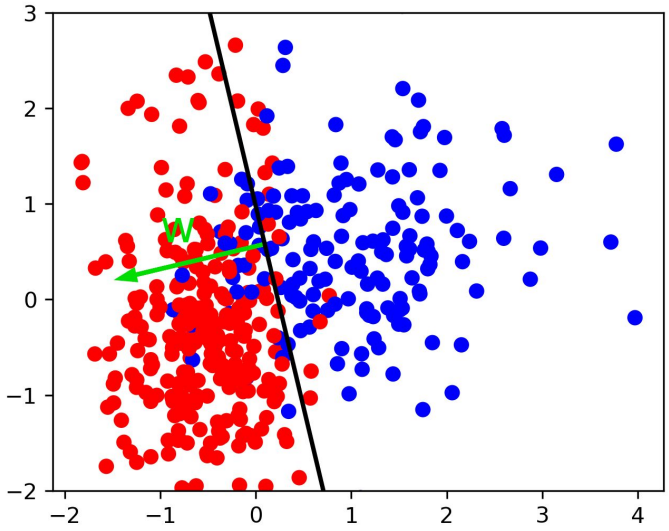
Aprendiz de Machine Learning

Linear Models for Classification

Linear Model

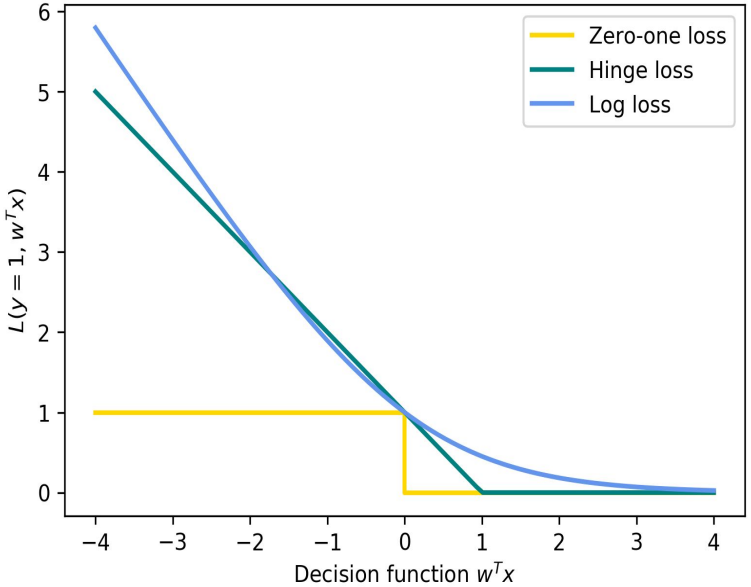
Linear Boundary



$$\hat{y} = \text{sign}(w^T \mathbf{x} + b) = \text{sign}\left(\sum_i w_i x_i + b\right)$$

Loss Function

Loss Function

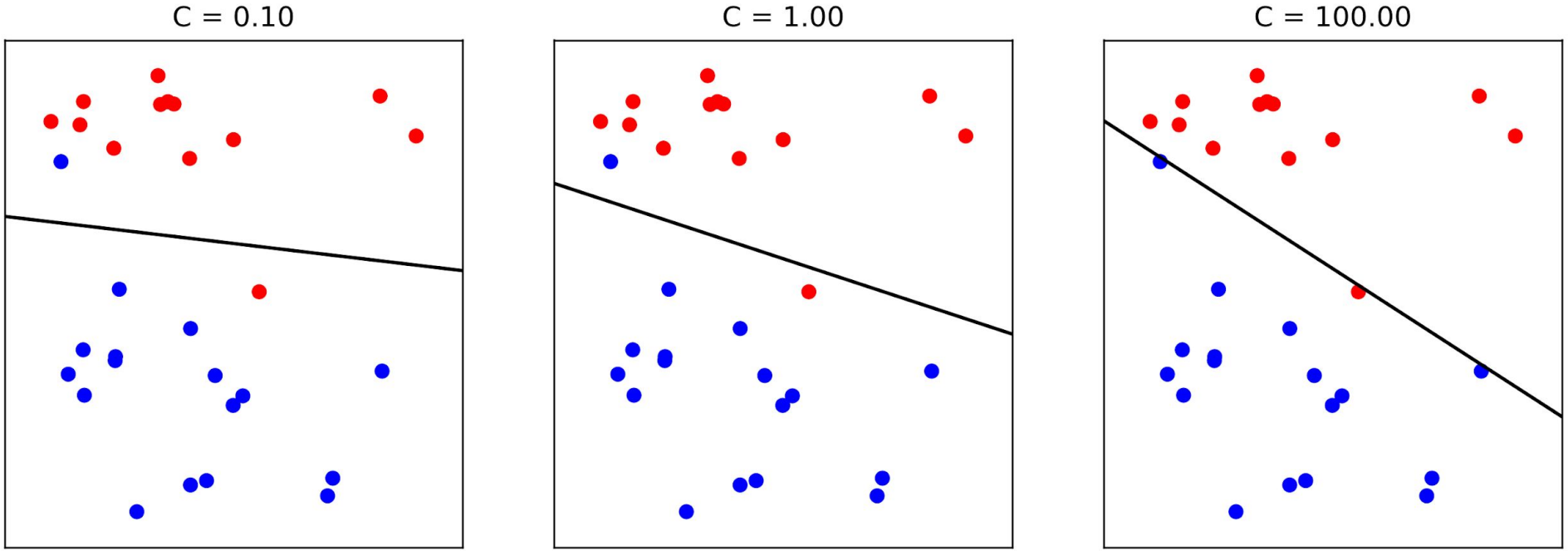


$$\hat{y} = \text{sign}(w^T \mathbf{x} + b)$$

$$\min_{w \in \mathbb{R}^p, b \in \mathbb{R}} \sum_{i=1}^{n} 1_{y_i \neq \text{sign}(w^T \mathbf{x} + b)}$$

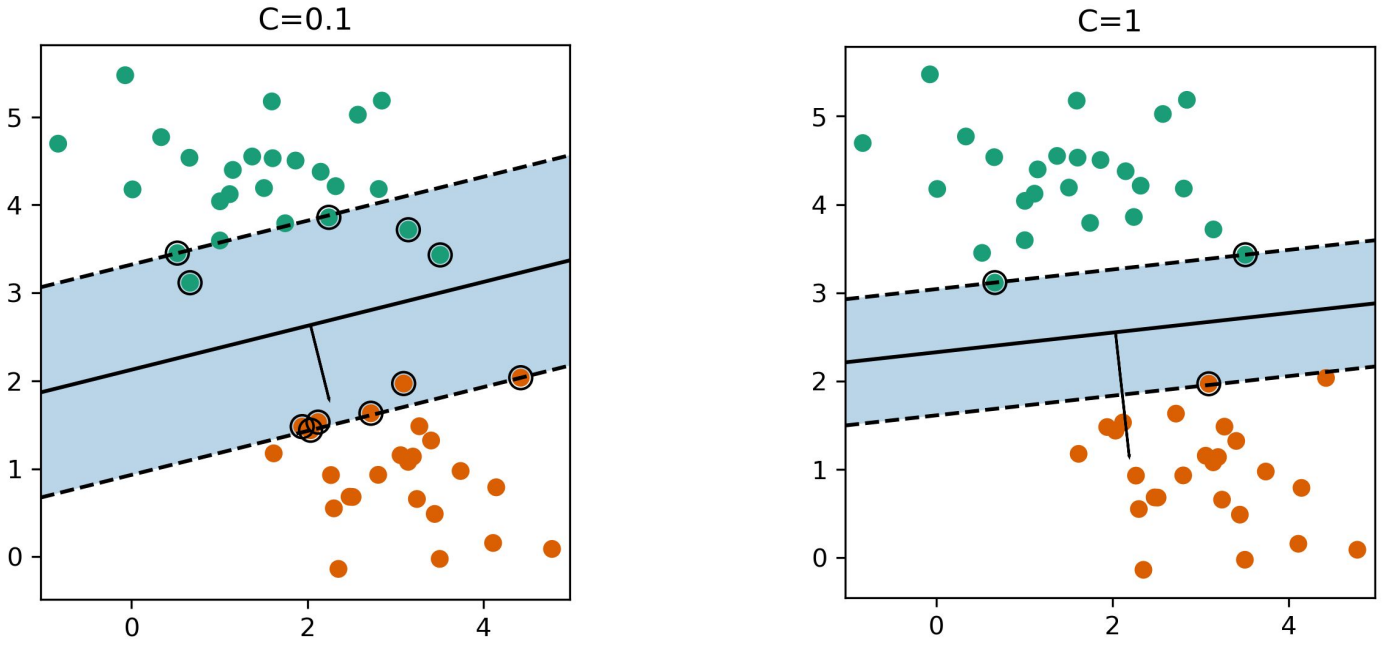
Classification Algorithms

Logistic Regression



Regularization Factor C: small C limits the influence of individual points.

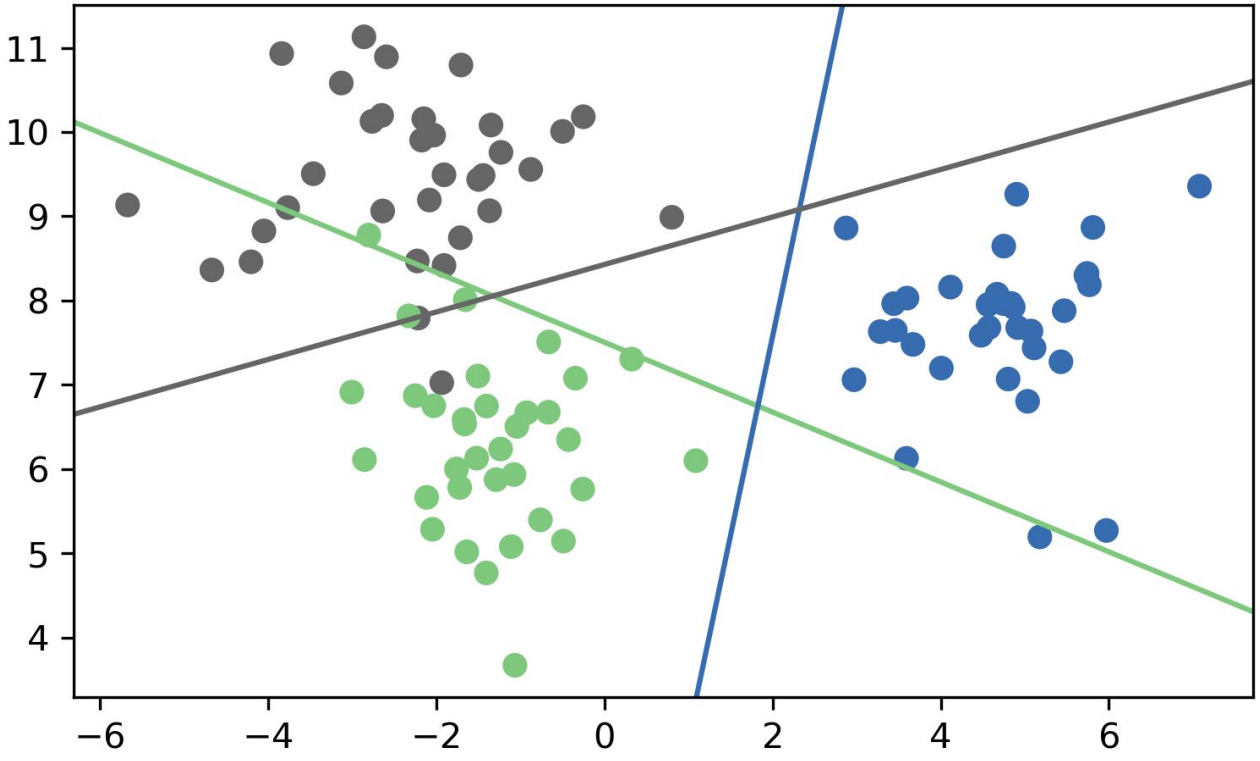
Support Vector Machines



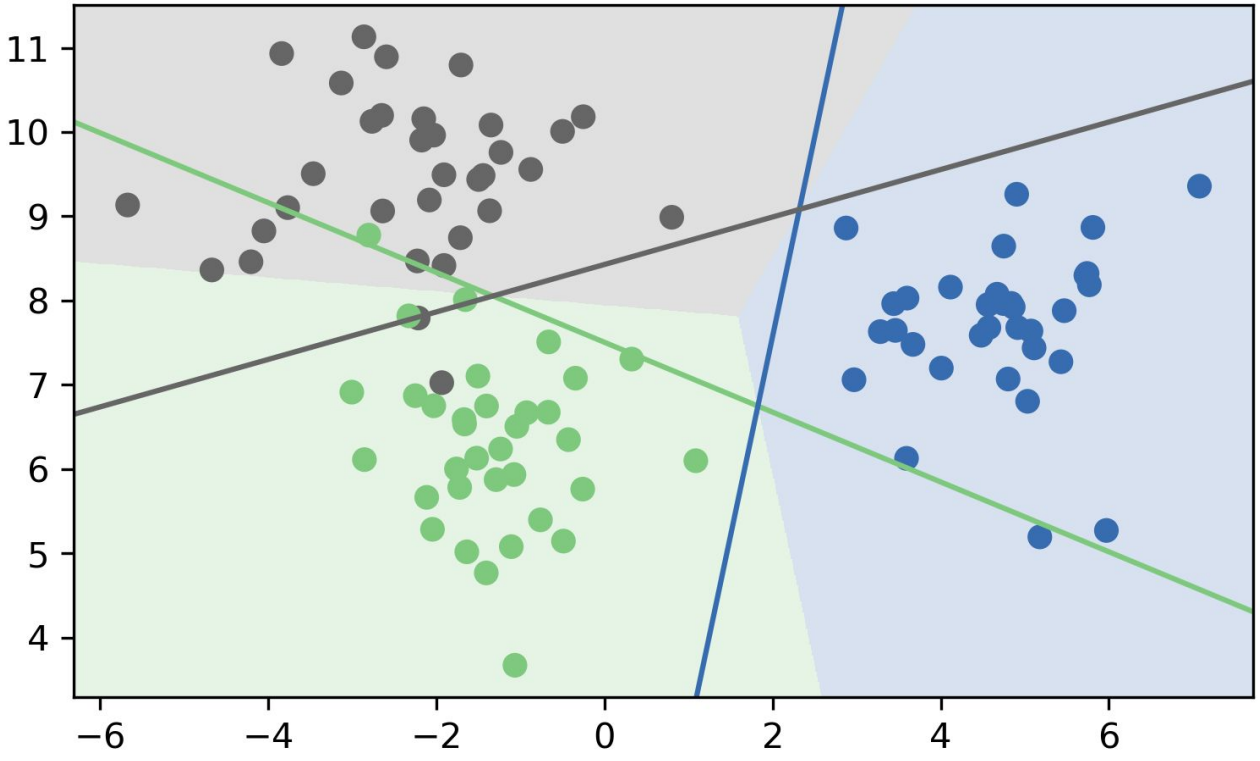
If I have larger C that means less regularization, which will lead to a larger W, larger W means a smaller margin

Multiclass Classification

One vs Rest



One vs Rest



Thank You!