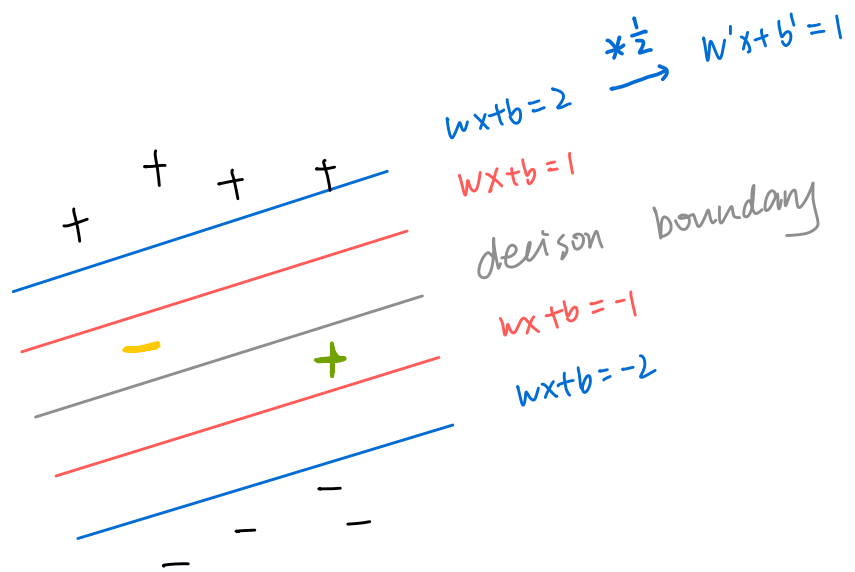


$$\text{Cost} = \underbrace{\frac{1}{2} \|w\|^2}_{C_1} + \underbrace{C \frac{1}{N} \sum_{i=1}^N \max(0, 1 - y_i (w x_i + b))}_{C_2}$$



misclassified sample

$$y_i = 1 \\ w x_i + b < 0$$

misclassified sample

$$y_i = -1 \\ w x_i + b > 0$$

correctly classified sample

	red	new blue
C_1	$\frac{1}{2} \ w\ ^2$	$\frac{1}{2} \ w'\ ^2 = \frac{1}{4} \ w\ ^2$
C_2	$1 - y_i (w x_i + b) = 1 - (w x_i + b)$	$1 - (w' x_i + b') = 1 - \frac{1}{2} (w x_i + b)$
C_1	$\frac{1}{2} \ w\ ^2$	$\frac{1}{2} \ w'\ ^2 = \frac{1}{4} \ w\ ^2$
C_2	$1 - y_i (w x_i + b) = 1 + (w x_i + b)$	$1 - (w' x_i + b') = 1 + \frac{1}{2} (w x_i + b)$
C_1	$\frac{1}{2} \ w\ ^2$	$\frac{1}{2} \ w'\ ^2 = \frac{1}{4} \ w\ ^2$
C_2	0	0