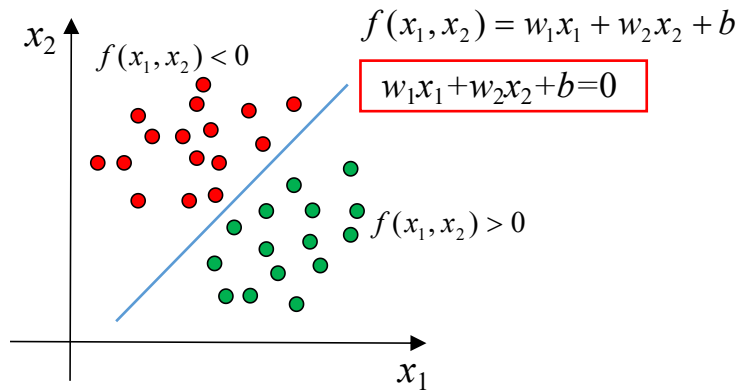




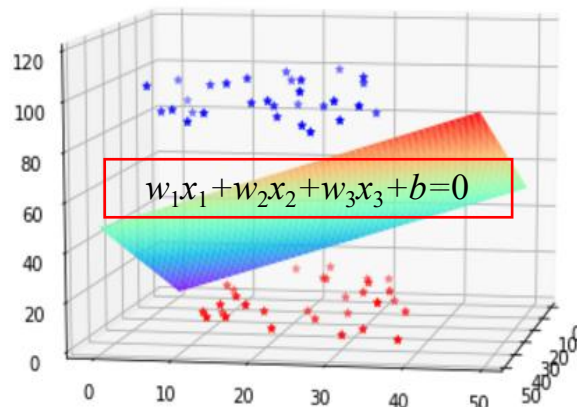
## 11.3 线性分类器

## ■ 线性分类器 (Linear Classifier)

**决策边界** m维空间: 超平面  $W^T X = 0$

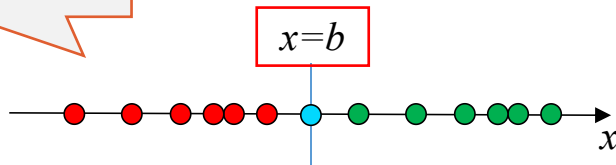


二维空间中的数据集

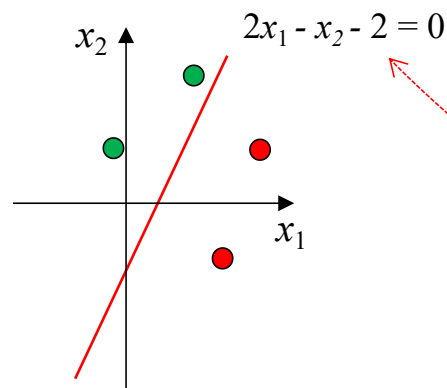


三维空间中的数据集

一维空间中的数据集



## □ 线性分类器实例



分类器

$$y = \text{step}(z) = \text{step}(2x_1 - x_2 - 2) \quad y = \sigma(z) = \sigma(2x_1 - x_2 - 2) \quad \text{逻辑回归}$$

$$z \geq 0, \quad y = 1$$

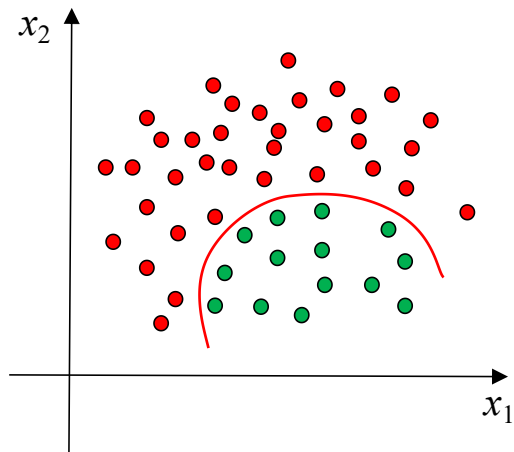
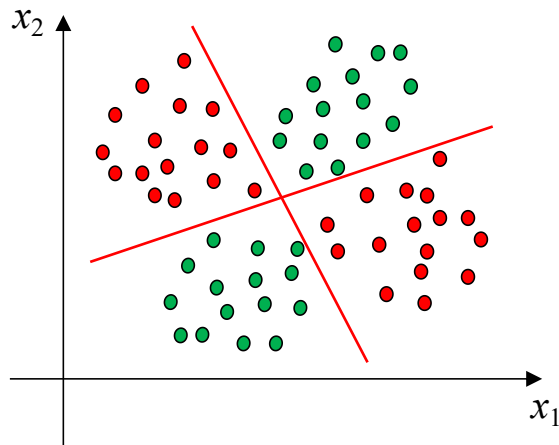
$$z < 0, \quad y = 0$$

$$y = \sigma(z) = \sigma(\underline{w_1x_1 + w_2x_2 + b})$$

$(x_1, x_2)$	$z = 2x_1 - x_2 - 2$	$y$
(1, 3)	-3	0
(3, 1)	3	1
(-1, 1)	-5	0
(2, -2)	4	1



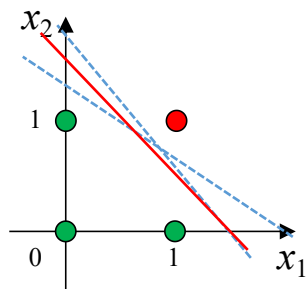
### ■ 线性不可分



## 逻辑运算

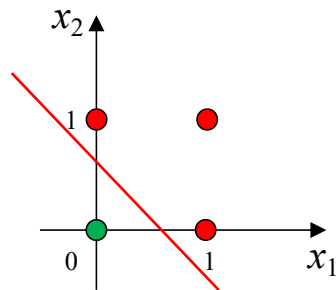
### 与运算

$(x_1, x_2)$	$y$
(0, 0)	0
(0, 1)	0
(1, 0)	0
(1, 1)	1



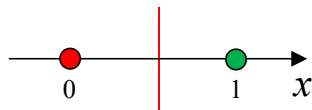
### 或运算

$(x_1, x_2)$	$y$
(0, 0)	0
(0, 1)	1
(1, 0)	1
(1, 1)	1



### 非运算

$x$	$y$
0	1
1	0



### 异或运算

$(x_1, x_2)$	$y$
(0, 0)	0
(0, 1)	1
(1, 0)	1
(1, 1)	0

