

## Linear Classifier Concepts

Goal:

Find a line (hyperplane) that separates two classes

Decision Function:

$$f(x) = w^T x + b$$



Classification Rule:

if  $f(x) > 0 \rightarrow$  **Class 1**

else  $\rightarrow$  **Class 0**



**Geometric View**

Distance from decision boundary



**Weight Vector w**

Perpendicular to decision boundary



**Bias Term b**

Shifts boundary position



**Multiple Features**

Hyperplane in high-dimensional space