

Labeled data

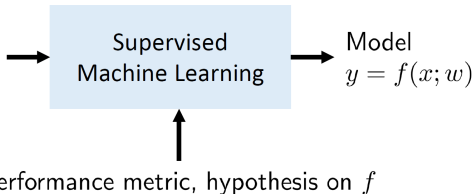
$$\mathcal{D} = \{(x_i, y_i)\} \subset \mathbb{X} \times \mathbb{Y}$$

$x_i \in \mathcal{D}_x$  data samples

$y_i \in \mathcal{D}_y$  labels

$$\mathbf{x} = [x_i]$$

$$\mathbf{y} = [y_i]$$



## Model purpose – Classification

- ▶ The model  $f$  shall map  $x \mapsto y$  and approximate an unknown function  $\hat{f} : \mathbb{X} \rightarrow \mathbb{Y}$
- ▶  $y_i \in \mathbb{Y} \subseteq \mathbb{N}^{n_y}$
- ▶ Examples: spam filter, fraud detection, fault detection, ...