

## NEAREST NEIGHBOR PREDICTORS

## Why

We might expect similar precepts to lead to similar postcepts.

## **Definition**

Consider a set of inputs X with a metric  $d: X \times X \to \mathbb{R}$ Let  $D = (x^1, y^1), \dots, (x^n, y^n)$  a dataset in  $X \times Y$  The nearest-neighbor predictor is the predictor  $f: X \to Y$  which assigns to  $x \in X$  the value ...

## Notation

Let  $D = ((a^1, b^1), \dots, (a^n, b^n))$  be a dataset in  $A \times B$ , where A and B are non-empty sets. Let f be the nearest neighbor inductor. Then  $\iota(D)(x)$  is Let n be a natural number. Let  $\Xi$  be a length n paired record sequence in  $\mathcal{U} \times \mathcal{V}$ ; so

$$\Xi = ((u^1, v^1), \dots, (u^n, v^n))$$

with  $u^i \in \mathcal{U}$  and  $v^i \in \mathcal{V}$  for i = 1, ..., n.

The nearest neighbor induction associates  $\Xi$  with the function  $f_{\Xi}$  such that

$$f_{\Xi}(u) = v^j$$

where j < n is the largest integer such that

$$d(u, u^j) = \min_{i} \{d(u, u^i)\}.$$

