



Why

We are given an element of some set, and want to find an element (in some subset) which is most similar to it.

Definition

Consider a non-empty set, one of its subsets, and a similarity function on it. An *approximator* of an element of the set is any element of the subset. So we call the subset the set of *approximators*. One approximator may be more similar than another. An *optimal* approximator is a minimizer of the similarity function over the set of approximators.

Notation

Let B be a non-empty set. Let $A \subset B$. Let $d : B \times B \rightarrow \mathbf{R}$ be a similarity function. For $b \in B$, every $a \in A$ is an approximator of b . An optimal b is a solution of

$$\begin{aligned} & \text{minimize} && d(b, a) \\ & \text{subject to} && a \in A. \end{aligned}$$

ε approximations

Let $a, b \in B$. For $\varepsilon > 0$, we say that an element b ε -approximates $a \in A$ if $d(a, b) \leq \varepsilon$.

