Approximators

1 Why

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

2 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.

2.1 Notation

Let A be a non-empty set. Let $B \subset A$. Let $d : A \times A \to \mathbf{R}$ be a similarity function. If $a \in A$, any $b \in B$ is an approximator. But an optimal approximator of a is a solution of

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