



# 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  $B$  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

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





