



### Why

We want to summarize a dataset in  $\mathbf{R}$  with a density.

### Definition

The *likelihood* (or *density likelihood*) of a density  $f : \mathbf{R} \rightarrow \mathbf{R}$  on a dataset  $x^1, \dots, x^n \in \mathbf{R}$  is  $\prod_{k=1}^n f(x^k)$ . A *maximum likelihood density* is a density which maximizes the likelihood among all densities.

As with probability distributions, we say that we are selecting the distribution according to the *maximum likelihood principle*. In general, we call any function from datasets to densities a *density selector*.



