

## MAXIMUM LIKELIHOOD DENSITIES

## Why

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

## Definition

The likelihood (or density likelihood) of a density  $f: \mathbf{R} \to \mathbf{R}$  on a datset  $x^1, \ldots, x^n \in \mathbf{R}$  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*.

