

## MAXIMUM LIKELIHOOD DISTRIBUTIONS

## Why

We want to summarize a dataset with a distribution.

## Overview

The likelihood (or distribution likelihood) of a probability distribution  $p:A\to \mathbf{R}$  on a dataset  $a^1,\ldots,a^n\in A$  is  $\prod_{i=1}^n p(a^i)$ . A maximum likelihood distribution  $p^\star:A\to \mathbf{R}$  is one which maximizes the likelihood over all distributions on A.

We call the correspondence between datasets and distributions the maximum likelihood algorithm. We say that we are selecting the distribution according to the maximum likelihood principle. In general, we call any function from datasets to distributions a distribution selector.

