



Why

¹ We want to speak of the pairwise conditional distributions of a particular joint distribution.

Definition

Let $p : \prod_{i=1}^n A_i \rightarrow \mathbf{R}$ be a distribution on A .

For $i \neq j \in \{1, \dots, n\}$, the *conditional distribution* of i on j is the function $p_{i|j} : A_i \times A_j \rightarrow \mathbf{R}$ defined so that that $p_{i|j}(\cdot, b)$ is the conditional distribution induced by conditioning on $\{a \in \prod_{i=1}^n A_i \mid a_j = b\}$.

For $i, j = 1, \dots, n$ and $i \neq j$, p_i and $p_{i,j}$ satisfy

$$p_{i|j}(b, c)p_j(c) = p_{ij}(b, c)$$

for $b \in A_i$ and $c \in A_j$.

¹Future editions will rework this sheet.

