

Definition (Sum of functionalities for monoidal posets)

If the poset \mathbf{P} is monoidal with monoidal product \otimes , then the “*sum*” of m copies of \mathbf{P} is a design problem given by

$$\begin{aligned} \Sigma_m : \mathbf{P} \times (\mathbf{P}^m)^{\text{op}} &\longrightarrow_{\mathbf{Pos}} \mathbf{Bool} \\ \langle x^*, \langle y_1, \dots, y_m \rangle \rangle &\longmapsto (x \leq_{\mathbf{P}} y_1 \otimes \dots \otimes y_m). \end{aligned}$$

Diagrammatically:

