

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

$$\Sigma_m : \mathbf{P} \times (\mathbf{P}^m)^{\text{op}} \qquad \xrightarrow{\text{Pos}} \quad \mathbf{Bool}$$

$$\langle x^*, \langle y_1, \dots, y_m \rangle \rangle \qquad \longmapsto \quad (x \leq_{\mathbf{P}} y_1 \otimes \dots \otimes y_m).$$

Diagrammatically:

