

# **Definition** (Monoidal product in **DP**)

Given two design problems  $\mathbf{d} : \mathbf{P} \rightarrow \mathbf{Q}$  and  $\mathbf{e} : \mathbf{R} \rightarrow \mathbf{S}$ , their *monoidal product*  $\mathbf{d} \otimes \mathbf{e} : \mathbf{P} \times \mathbf{R} \rightarrow \mathbf{Q} \times \mathbf{S}$  is their conjunction:

$$\mathbf{d} \otimes \mathbf{e} : (\mathbf{P} \times \mathbf{R})^{\text{op}} \times (\mathbf{Q} \times \mathbf{S}) \rightarrow_{\text{Pos}} \mathbf{Bool},$$
$$\langle \langle p, r \rangle^*, \langle q, s \rangle \rangle \mapsto \mathbf{d}(p^*, q) \wedge \mathbf{e}(r^*, s).$$

The diagrammatic representation of the monoidal product is reported in ??.