Definition (Union of design problems)

- Given two design problems $\mathbf{d}: \mathbf{P} \longrightarrow \mathbf{Q}$ and $\mathbf{e}: \mathbf{P} \longrightarrow \mathbf{Q}$, their union $\mathbf{d} \vee$
- $e: P \longrightarrow Q$ is defined by

 $(\mathbf{d} \vee \mathbf{e}) : \mathbf{P}^{\mathrm{op}} \times \mathbf{Q} \rightarrow_{\mathbf{Pos}} \mathbf{Bool}$

 $\langle p^*, q \rangle \mapsto \mathbf{d}(p^*, q) \vee \mathbf{e}(p^*, q).$