**Definition** (Identity design problem). For any poset **A**, the *identity design prob* $lem id_A : A \longrightarrow A$  is a monotone map

$$\operatorname{id}_{\mathbf{A}}: \mathbf{A}^{\operatorname{op}} \times \mathbf{A} \to_{\operatorname{\mathbf{Pos}}} \mathbf{Bool},$$

 $\langle a_1^*, a_2 \rangle \mapsto a_1 \leq_{\mathbf{A}} a_2.$