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

$$id_{\mathbf{A}}: \mathbf{A}^{\mathrm{op}} \times \mathbf{A} \rightarrow_{\mathbf{Pos}} \mathbf{Bool},$$

 $\langle a_1^*, \mathbf{a}_2 \rangle \mapsto a_1 \leq_{\mathbf{A}} \mathbf{a}_2.$