Definition (Identity design problem). For any poset A, the *identity design problem* $\mathrm{id}_A : A \longrightarrow A$ is a monotone map

$$\mathrm{id}_A : A^{\mathrm{op}} \times A \xrightarrow{\quad} _{\mathbf{Pos}} \mathbf{Bool},$$

$$\langle a_1{}^*, a_2 \rangle \mapsto a_1 \preceq_A a_2.$$