

**Definition** (Design Problem). A design problem (DP) is a tuple  $\langle \mathbf{F}, \mathbf{R}, \mathbf{f} \rangle$ , where  $\mathbf{F}, \mathbf{R}$  are posets and  $\mathbf{f}$  is a monotone map of the form

$$\mathbf{f} : \mathbf{F}^{\text{op}} \times \mathbf{R} \xrightarrow{\text{Pos}} \mathbf{Bool}.$$

We will also use the notation  $\mathbf{f} : \mathbf{F} \dashrightarrow \mathbf{R}$  for design problems, in order to emphasize how we think of them as morphisms. This will be explained below.