

Unir con flechas los tipos que unifican entre sí (entre una fila y la otra). Para cada par unificable, exhibir el *mgu* ("most general unifier").

$$\begin{array}{ccccccc} X_1 \rightarrow X_2 & & \text{Nat} & & X_2 \rightarrow \text{Bool} & & X_3 \rightarrow X_4 \rightarrow X_5 \\ X_1 & & \text{Nat} \rightarrow \text{Bool} & & (\text{Nat} \rightarrow X_2) \rightarrow \text{Bool} & & \text{Nat} \rightarrow X_2 \rightarrow \text{Bool} \end{array}$$

$$X_1 \rightarrow X_2$$

$$\text{mgu} \{ X_1 \rightarrow X_2 \doteq X_1 \} = \text{Falla por Occurs-Check}$$

$$\text{mgu} \{ X_1 \rightarrow X_2 \doteq \text{Nat} \rightarrow \text{Bool} \}$$

$$= \text{mgu} \{ X_1 \doteq \text{Nat}, X_2 \doteq \text{Bool} \}$$

decompose

$$= \{ X_1 := \text{Nat}, X_2 := \text{Bool} \}$$

elim 2 veces: X_1, X_2

$$\text{mgu} \{ X_1 \rightarrow X_2 \doteq (\text{Nat} \rightarrow X_2) \rightarrow \text{Bool} \}$$

$$= \text{mgu} \{ X_1 \doteq \text{Nat} \rightarrow X_2, X_2 \doteq \text{Bool} \}$$

decompose

$$= \text{mgu} \{ X_1 \doteq \text{Nat} \rightarrow \text{Bool} \}$$

elim X_2

$$= \{ X_1 := \text{Nat} \rightarrow \text{Bool}, X_2 := \text{Bool} \}$$

elim X_1

$$\text{Nat}$$

$$\text{mgu} \{ \text{Nat} \doteq X_1 \}$$

$$= \text{mgu} \{ X_1 \doteq \text{Nat} \}$$

swap

$$= \{ X_1 := \text{Nat} \}$$

elim X_1

$X_2 \rightarrow \text{Bool}$

$$\begin{aligned} \text{mgu} \{ X_2 \rightarrow \text{Bool} &\doteq X_1 \} \\ &= \text{mgu} \{ X_1 \doteq X_2 \rightarrow \text{Bool} \} && \text{swap} \\ &= \{ X_1 := X_2 \rightarrow \text{Bool} \} && \text{elim } x_1 \end{aligned}$$

$$\begin{aligned} \text{mgu} \{ X_2 \rightarrow \text{Bool} &\doteq \text{Nat} \rightarrow \text{Bool} \} \\ &= \text{mgu} \{ X_2 \doteq \text{Nat}, \text{Bool} \doteq \text{Bool} \} && \text{decompose} \\ &= \text{mgu} \{ X_2 \doteq \text{Nat} \} && \text{delete} \\ &= \{ X_2 := \text{Nat} \} && \text{elim } x_2 \end{aligned}$$

$$\begin{aligned} \text{mgu} \{ X_2 \rightarrow \text{Bool} &\doteq (\text{Nat} \rightarrow X_2) \rightarrow \text{Bool} \} && \text{decompose} \\ &= \text{mgu} \{ \textcolor{red}{X}_2 \doteq \text{Nat} \rightarrow \textcolor{red}{X}_2, \text{Bool} \doteq \text{Bool} \} \\ &= \textcolor{red}{\text{Fallar por Occurs-Check}} \end{aligned}$$

$X_3 \rightarrow X_4 \rightarrow X_5$

$$\begin{aligned} \text{mgu} \{ X_3 \rightarrow X_4 \rightarrow X_5 &\doteq \text{Nat} \rightarrow X_2 \rightarrow \text{Bool} \} \\ &= \text{mgu} \{ X_3 \doteq \text{Nat}, X_4 \rightarrow X_5 \doteq X_2 \rightarrow \text{Bool} \} && \text{decompose } 1er \rightarrow \\ &= \text{mgu} \{ X_3 \doteq \text{Nat}, X_4 \doteq X_2, X_5 \doteq \text{Bool} \} && \text{decompose } 2da \rightarrow \\ &= \{ X_3 := \text{Nat}, X_4 := X_2, X_5 := \text{Bool} \} && \text{elim 3 veces: } X_3, X_4, X_5 \end{aligned}$$