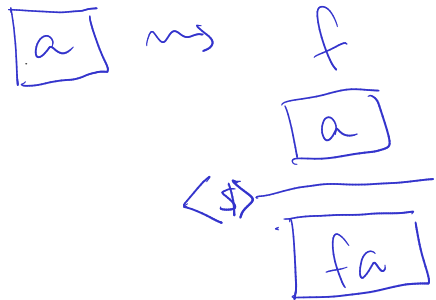
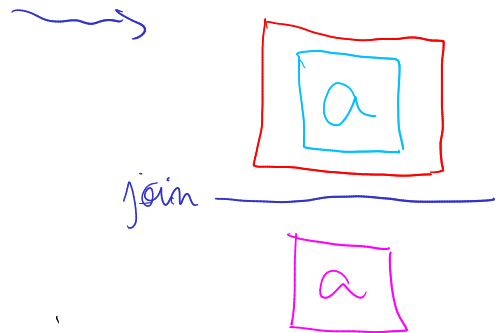
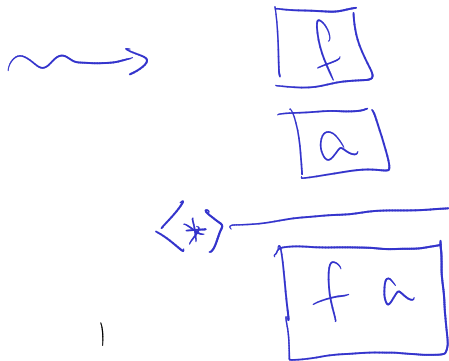


"caixa"  $\rightsquigarrow$  Functor



$\rightsquigarrow$  Applicative  $\rightsquigarrow$  Monad



"functorialidade"

as caixas formam monóide

$\mathcal{C}$ ,  $M: \mathcal{C} \rightarrow \mathcal{C}$

$f: A \rightarrow MB$

$g: B \rightarrow MC$

---

$h: A \rightarrow MC$ ,

$h = f \Rightarrow g$

$\left\{ \begin{array}{l} f \Rightarrow \text{return} = f \\ \text{return} \Rightarrow f = f \\ \Rightarrow \text{e' associative} \end{array} \right.$

Kleisli  $M$

$f: A \rightarrow B$

$g: B \rightarrow C$

---

$h: A \rightarrow C$ ,  $h = f \circ g$

$f ; \text{id} = f$

$\text{id} ; f = f$

$;$  associative

IO string >>= string → IO()

getline >>= putStrLn

