Algebras for a Functor

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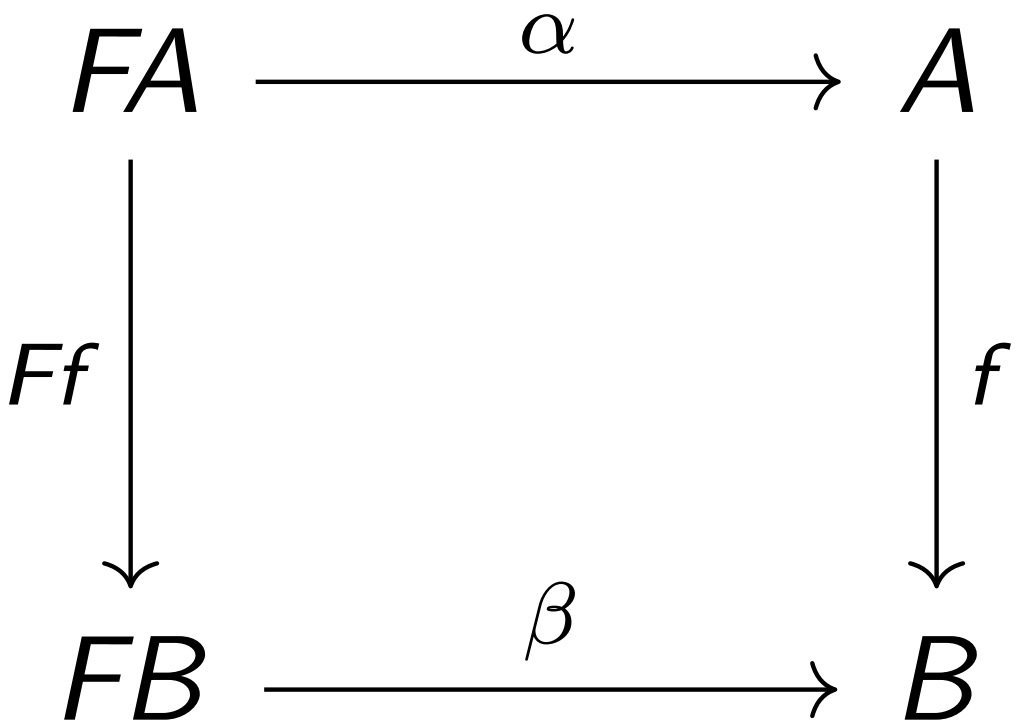
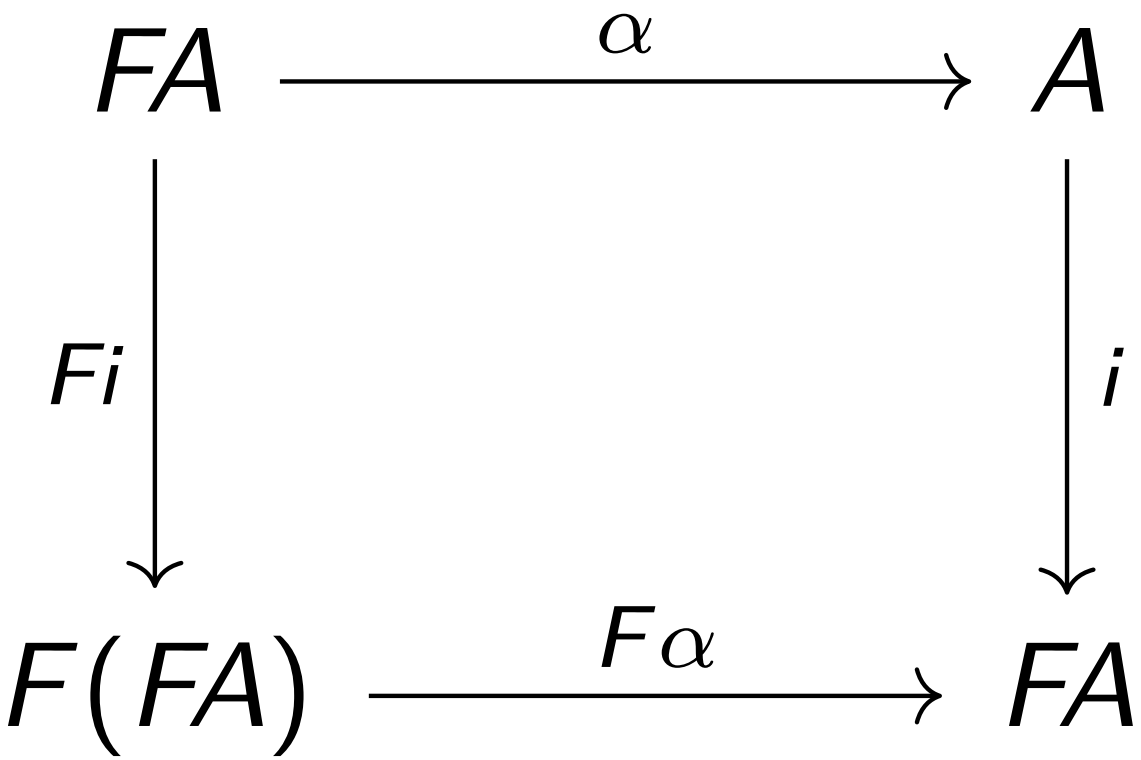
Motivation

F-Algebras



Initial Objects

Lambek Lemma



Polynomial Functor

- project only defines them on **Sets**
- $PX = \sum_{i \in I} X^{A_i}$, for $A : I \to \mathbf{Set}$
- natural numbers from $PX = 1 + X$

Initial algebra for polynomial functors

- Tree has a constructor Node $\sum_{i \in I} \text{Tree}^{A_i}$
- initial object is the F-algebra of the Tree

$$\begin{array}{ccc} \sum_{i \in I} \text{Tree}^{A_i} & \xrightarrow{\alpha} & \text{Tree} \\ \downarrow{\scriptstyle Pf} & & \downarrow{\scriptstyle f} \\ \sum_{i \in I} B^{A_i} & \xrightarrow[\beta]{} & B \end{array}$$

Problems in Implementation

Future work

- implement presentation of natural numbers with F-algebras
- implement presentation of lists with F-algebras
- generalize polynomial functors
- generalize existance of initial algebras