

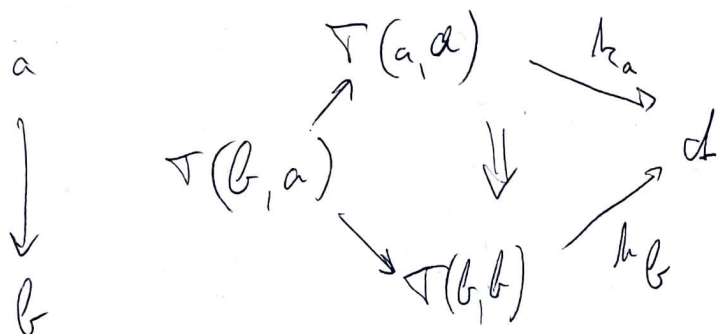
$$+ : (A: \mathcal{C}) \rightarrow \mathcal{D}(A)$$

$$\begin{array}{ccc} \cdot & \xrightarrow{\quad} & \int_{\mathcal{C}} \\ \uparrow i & \lrcorner & \uparrow \\ \mathcal{C}' & \xrightarrow{\quad} & \mathcal{C} \end{array}$$

$$\mathcal{C}' \rightarrow \mathcal{C} \xrightarrow{\quad} \mathcal{C}_{\text{ext}}$$

Cowedge from $\mathcal{T}: \mathcal{A} \times \mathcal{A} \rightarrow \mathcal{C}at$ to \mathcal{A}

$k: \forall a: k \mathcal{T}(a, a) \rightarrow \textcircled{\mathcal{A}} \rightarrow a$



If $\mathcal{D} = \mathcal{C}at$

\mathcal{D} is a category with:

$\textcircled{\mathcal{T}_{\mathcal{D}}}: \mathcal{D}^{\mathcal{D}} \rightarrow \mathcal{C}at$ with comp

$\text{Term}_{\mathcal{D}}: \int_{\mathcal{D}} \mathcal{T}_{\mathcal{D}} \rightarrow \mathcal{S}et$

$\textcircled{\mathcal{T}_{\mathcal{D}}}: \mathcal{D}^{\mathcal{D}} \rightarrow \mathcal{C}at$ with comp

$\text{Term}_{\mathcal{D}}: \int_{\mathcal{D}} \mathcal{T}_{\mathcal{D}} \rightarrow \mathcal{D}$

~~$\text{Hom}: \text{Prof}_0: \mathcal{D}^{\mathcal{D}} \times \mathcal{D} \rightarrow \mathcal{C}at$~~

$\text{op}: \mathcal{D} \rightarrow \mathcal{D}$

~~$\text{Prof}_0: \mathcal{D} \rightarrow \mathcal{D} \rightarrow \mathcal{C}at$~~

~~$\text{Ty}_0(n) \rightarrow \text{Prof}_0(n, n)$~~

$\text{Hom}: \text{Prof}_0$

$\prod_{n \in \mathcal{D}} \text{Prof}_0(n, n^{\text{op}}) \quad \text{Ty}_0(x^{\text{op}} \otimes n)$

$\text{Hom}: \mathcal{K}C\mathcal{A} \rightarrow \mathcal{K}C\mathcal{A}^+ \rightarrow \textcircled{\bullet}$

$\text{Ty}_{\mathcal{D}}(\textcircled{\mathbb{I}}) = \textcircled{\bullet} ?$ yes

$\text{Ty}_0(\mathcal{C}) = \text{Psh}(\mathcal{C})$
comp = cat of elements

$\text{Ty}_{\mathcal{D}}(\textcircled{\mathbb{I}}) = \mathcal{D} ?$ yes.

$\text{Ty}_0(\mathcal{C}) = [\mathcal{C}^{\mathcal{D}}, \mathcal{C}at]$

~~comp~~ comp = small ccats

Obj: \circ

Hom: $Obj \rightarrow Obj \rightarrow \circ \square$

id: $(x: Obj) \rightarrow Hom\ x\ x$

-o-: $(x, y, z: Obj) \rightarrow Hom\ x\ y \rightarrow Hom\ x\ y \rightarrow Hom\ x\ z$

limit: $(x, y: Obj) \rightarrow \text{~~id~~ } Hom\ x\ y \rightarrow id_y \circ \varphi = \varphi$

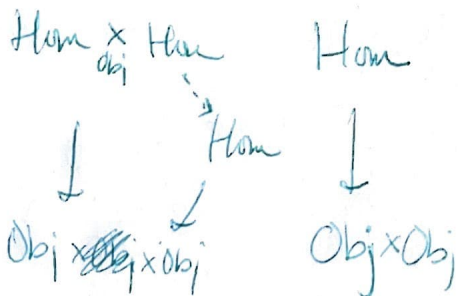
Obj: Set

Hom: $Obj \rightarrow Obj \rightarrow Obj(V)$

$Obj \rightarrow Obj \rightarrow Obj(\square)$

id: $\prod_{\square} I_{\square} \rightarrow \bigoplus_{x \in Obj} Hom\ (x, x) \quad \left(\prod_{x \in Obj} I_{\square} \right) \rightarrow Hom$

-o-: $(x, y, z: Obj) \rightarrow Hom\ x\ y \rightarrow Hom\ y\ z \rightarrow Hom\ x\ z$



-o-: $\prod_{x, y, z} Hom\ (y, z) \otimes Hom\ (x, y) \rightarrow Hom\ (x, z)$

limit: $\forall x, y \quad Hom\ x\ y \xrightarrow{(id_x, id_y)} Hom\ x\ y \otimes Hom\ x\ y \rightarrow Hom\ x\ y$