11/16 Twoples meeting.

- Hovey's presentation of model cats (axiomatic)

  vs. via weak factorization systems.

- eg's of model cats — Top

  MO/SE post about the model cat of spaces being a prototypical example.

  Top$_{\text{Hurewicz/Strøm}}$ vs. Top$_{\text{Quillen}}$.

  W: htpy eq's. W: weak htpy eq's

  use this one.

- def's of horns as a union

  $\Lambda^n_i = \bigcup_{k \neq i} \Delta^{n-1}_k$ vs. as a disjoint union $\coprod \Delta^{n-1}_k / (\text{glue})$

  use this.

x

to D-K: π_0 means homotopy category (of a simplicial cat.)

Hammock loc'n

a simplicially enriched cat. is a simplicial obj in Cats.
i.e. a functor $X : \Delta^{op} \to Cat$
s.t. every $X(f)$ is a bijection on objects.

double check this.

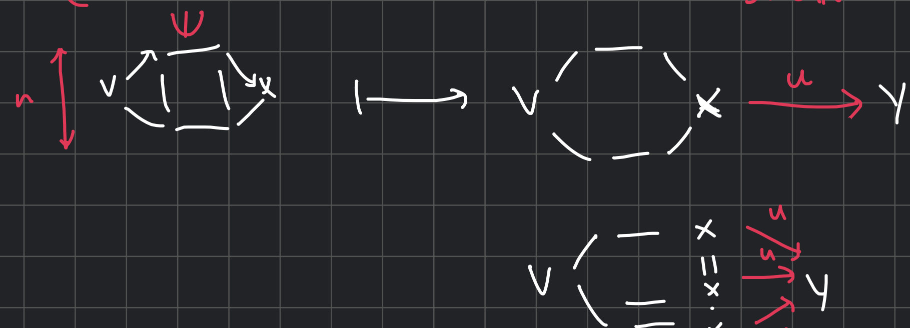
... so (simp. enriched cat) $\Rightarrow$ (simp. obj. in cats)

Prop. $L^H C \xleftarrow{\sim} \operatorname{diag} L^H F_* C \xrightarrow{\sim} LC$

what are weak eq's of sCats?
(i) for cats enriched over sSets
(ii) for simp. obj's in Cat.

$L^H C(V,X)_\bullet \xrightarrow{u_*} L^H C(V,Y)_\bullet$

$\{ L^H C(V,X)_n \xrightarrow{u_{*,n}} L^H C(V,Y)_n \}_{n\in\mathbb{N}}$



$X \xrightarrow{\varphi} Y$ is a weak eq. of ssets
iff
$|X| \to |Y|$ is a weak htpy eq. of spaces.
iff
???

~~$\exists$ a map $X \times \Delta^1 \xrightarrow{h} Y$~~

$$\cancel{\begin{tikzcd} X\times\Delta^{\{0\}} \arrow[d] \arrow[drr, bend left, "\varphi^{-1}\circ\varphi"] & & \\ X\times\Delta^1 \arrow[rr, "h"] & & X \\ X\times\Delta^{\{1\}} \arrow[u] \arrow[urr, bend right, "id_X"'] & & \end{tikzcd}}$$

~~+ some other stuff?~~

I think this is just htpy equiv. of ssets...

$$
\begin{tikzcd}
\text{Rel-Cat} \arrow[r, "\mathfrak{C}^H"] & s\mathcal{C}at \arrow[rr, bend left, "N_\Delta"] \arrow[d, dotted, "(-)^f"'] & & sSet \\
& \text{Kan-Cat} \arrow[u, hook] \arrow[rr, leftrightsquigarrow] & & q\mathcal{C}at \arrow[u, hook]
\end{tikzcd}
$$

$\simeq$ ∞ - Cats. $\simeq$

model cat'l.

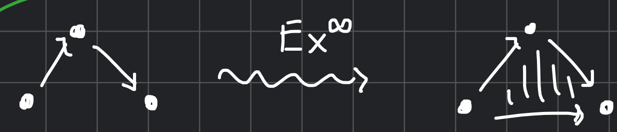
(1) fibrant replacement in what model structure? ($s\mathcal{C}at_{\text{Bergner}}$)

concrete

(2) How exactly does this go? (Kan's Ex^∞ functor) "thickens" ssets to Kan cpxes.

$\simeq$ (sorta)

top. spaces.



(3) Talk about how Kan-Cats are a model of ∞-cats.

<u>refs</u> • Ex^∞ (Guillou paper)

• htpy coherent nerve (see Mazel-Gee paper ref. to HTT Ch.1 ...) .