18/4/25

Examples

(1) P is a POSET

$P \to [P^{op}, \mathbb{B}]$

$\mathbb{B} = \{F, T\}$

$0, 1$

$\{\}, \{*\}$

(2) X is compact Hausdorff space

$[X, \mathbb{R}]$

(3) algebraic version

Spec

(4) Δ is a figure

$\Delta = \{ \cdot \rightrightarrows \cdot \}$

Bundles contravariant

Base → fiber

Total → Base

Presheaves & covering spaces

A is a category

$\mathrm{Hom}: A \times A^{op} \to \mathrm{Set}$

Yoneda embedding

$A \to [A^{op}, \mathrm{Set}]$

Spec??

2-Functor:

$\mathrm{Sm\,Cat} \to \mathrm{Cat}$

$A \mapsto [A^{op}, \mathrm{Set}]$

Hom space borrowing structure from the target

Branched / Fraged unmappings

$F \rightarrowtail T \twoheadrightarrow B$

$A^{op} \to \mathrm{Set}$??

equiv btn: Presheave & discrete fibrant

.....long exact htpy seq

(6) as above but

$a \otimes b = \max(a, b)$

generalized ultrametric spaces.

used in p-adic geometry.

(5) (Lawvere) generalized Metric spaces

A is enriched over symmetric monoidal cat of distances $= [0, \infty]$

$a \otimes b = a + b$

$a \geq b$

0 is terminal ∞ is initial

is closed cat.

$A \to [A^{op}, D]$

these are "cost functions"

$\mathrm{Hom}(a, -) + \mathrm{Hom}(b, -)$