Eine Woche, ein Beispiel
6.24 (co)homology of simplicial set

singular: Top $\longrightarrow$ sSet $\longrightarrow$

$\uparrow$

Δ - cplx

simplicial: $\cup$ $\downarrow$ subdivide

simplicial cplx

de Rham: sm mfld $\longrightarrow$

$\downarrow$

sheaf Čech Sheaf +open cover $\longrightarrow$

derived fctor $\longrightarrow$

$\vdots$ $\vdots$

Chain

cplx

$\xrightarrow[\text{algebra}]{\text{homological}}$ (co)homology
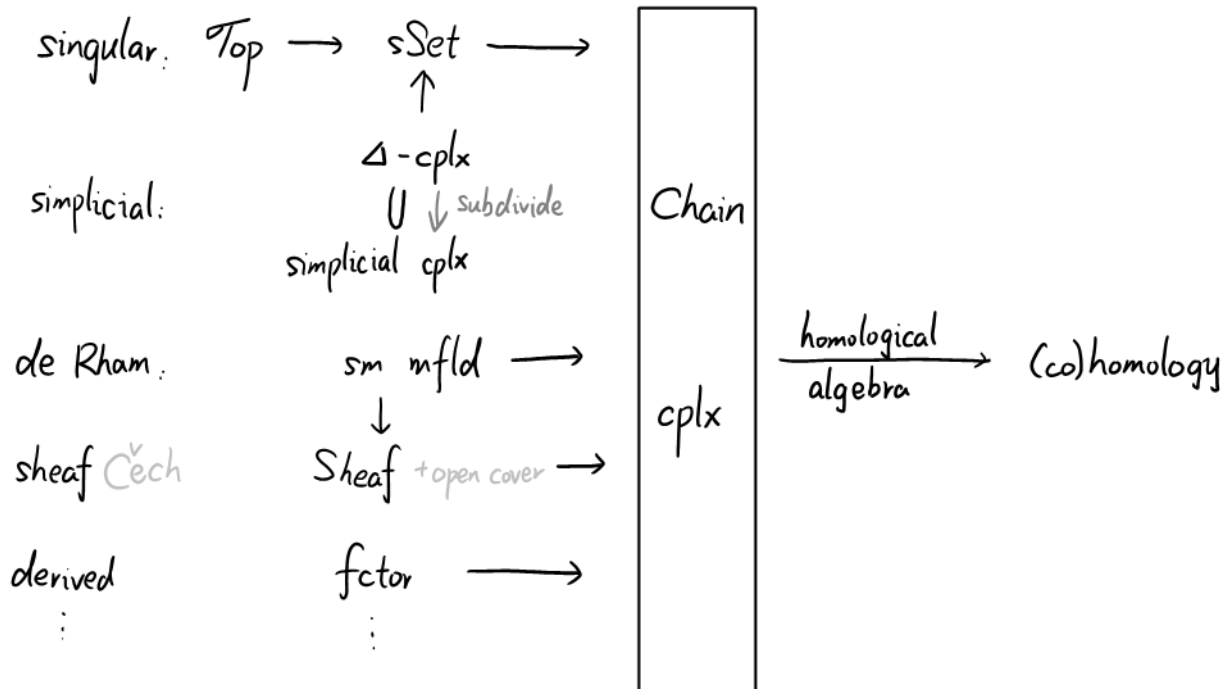
Today: sSet $\longrightarrow$ chain cplx $---\rightarrow$ (co)homology

1. definition and basic examples
2. more structures

1. definition and basic examples

Def. For $X \in s\text{Set}$, $G \in \text{Mod}(\mathbb{Z})$, define

$$C_n(X;G) = \bigoplus_{\alpha \in X_n} G \qquad 0 \longleftarrow \bigoplus_{\alpha \in X_0} G \xleftarrow{(d_0' - d_1')^*} \bigoplus_{\alpha \in X_1} G \xleftarrow{(d_0^2 - d_0^1 + d_2^2)^*} \bigoplus_{\alpha \in X_2} G \cdots$$

$$C^n(X;G) = \prod_{\alpha \in X_n} G \qquad 0 \longrightarrow \prod_{\alpha \in X_0} G \xrightarrow{\text{dual}} \prod_{\alpha \in X_1} G \longrightarrow \prod_{\alpha \in X_2} G \cdots$$

$$C_n^{BM}(X;G) =$$

$$C_c^n(X;G) =$$

$$\text{Hom}_{\mathbb{Z}\text{-mod}}\left(\bigoplus_{\alpha \in X_n} \mathbb{Z}, G\right) \cong \prod_{\alpha \in X_n} \text{Hom}_{\mathbb{Z}\text{-mod}}(\mathbb{Z}, G) \cong \prod_{\alpha \in X_n} G$$