Info

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Eilenberg–Steenrod functors

$$(H_n : \mathsf{Top} \times \mathsf{Top} \to \mathsf{Ab}, \partial_n)$$

Definition. Eilenberg–Steenrod functors

A tuple

$$(H_n, \partial_n)_{n \in \mathbb{N}}$$

consisting of

- a sequence of functors called *homology*

$$H_n : \mathsf{Top} \times \mathsf{Top} \to \mathsf{Ab}$$

- natural transformations called *boundary*

$$\partial_n : H_n(X, A) \to H_{n-1}(A, \emptyset)$$

is called **Eilenberg–Steenrod functors** if that satisfy

- *Homotopy invariant* Homotopic maps $X \to Y$ induce same map in $H_n(X) \to H_n(Y)$
- *Excision*
- *Dimension invariant*

$$H_n(\{\bullet\}, \emptyset) = 0$$

  for all $n \neq 0$
- *Additivity*

$$H_n(\coprod_\alpha X_\alpha, \emptyset) \cong_{\mathsf{Ab}} \bigoplus_\alpha H_n(X_\alpha, \emptyset)$$

- Exactness

Current note has 0 direct children and 0 total descendants.

- structures based on sets
  - Topological spaces
    - Eilenberg–Steenrod functors

$$(H_n : \mathsf{Top} \times \mathsf{Top} \to \mathsf{Ab}, \partial_n)$$

And it has 29 siblings.

- structures based on sets
  - Topological spaces
    - Group action on topological spaces
    - Discrete subgroup acting on coset space
    - Basis and subbasis for a topology
    - Principal G-bundles over topological spaces

$$G \curvearrowright P \to X$$

    - Vector bundles over topological spaces
    - Closure of a subset of topological space
    - Locally compact and 2-countable Hausdorff topological spaces are paracompact with countable refinement
    - Covering dimension of topological spaces
    - $\mathrm{End}\mathsf{Top}(X, Y)$
    - Eilenberg–Steenrod functors

$$(H_n : \mathsf{Top} \times \mathsf{Top} \to \mathsf{Ab}, \partial_n)$$

    - Local fields
    - Local fields of characteristic 0
    - Topological groups
    - Continuous group action on a topological space
    - Intersection of open, dense subsets of a topological space
    - Local topological spaces
    - Covering space of a topological space
    - Borel measures on a topological space
    - Convergence for nets in a topological space
    - Loops and a open cover of a topological space
    - Paths in a topological space
    - Product of topological spaces
    - Ringed topological spaces
    - Sheaf on open sets of a topological space
    - Closed subsets of a topological space
    - Discrete subsets of topological spaces
    - Types of topological spaces
    - Locally compact Hausdorff spaces

- Topological vector spaces over $\mathbb{R}$ or $\mathbb{C}$