Content Dictionaries for Algebraic Topology

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Content Dictionaries are available at:

`http://www.unirioja.es/cu/joheras/xhtml/Algebraic-Topology.xhtml`

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Introduction

- Kenzo is a Common Lisp system devoted to Symbolic Computation in Algebraic Topology

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- Goal:
  - Develop these OpenMath Content Dictionaries

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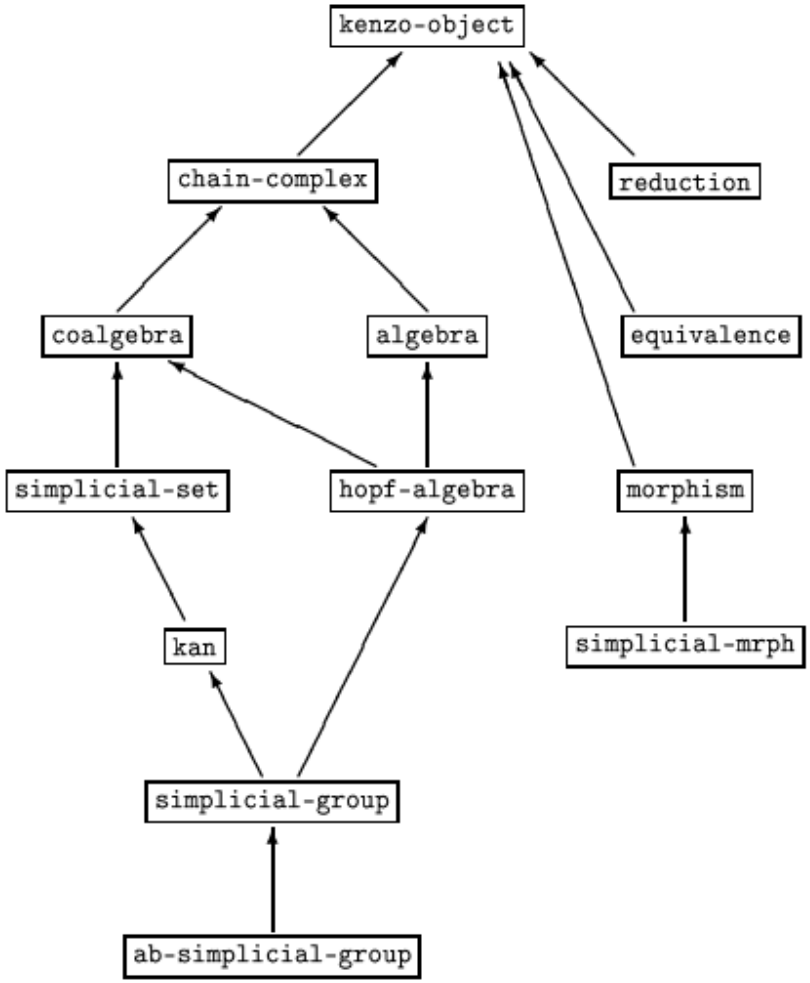
Kenzo Content Dictionaries

- Kenzo works with the main mathematical structures used in Simplicial Algebraic Topology



Organization of CDs

- All the mathematical structures Kenzo works with are graded structures.
- Each graded structure is represented in Kenzo by means of the invariant of its underlying set.

```
inv: U nat  -> bool
     x  n   -> True  if x ∈ K^n
               False if x ∉ K^n
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Specification of a Mathematical Structure $\langle \Sigma, Prop \rangle$ $\rightarrow$ Specification of a Mathematical Structure *Representation* $\langle \Sigma \cup \{inv\}, Prop \cup \{Prop_{inv}\} \rangle$

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Specification of a Mathematical Structure $\langle \Sigma, Prop \rangle$ $\rightarrow$ Specification of a Mathematical Structure *Representation* $\langle \Sigma \cup \{inv\}, Prop \cup \{Prop_{inv}\} \rangle$

- Each OpenMath Representation of a Mathematical Structure has:
  - Signature (in a Signature Dictionary)
  - Properties of the mathematical structure
  - Example
  - Predefined Objects (optional)

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From a Kenzo CD to an ACL2 encapsulate

- Goal: Integration of Kenzo with ACL2 to increase the reliability of the Kenzo system
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- Encapsulate:
  - Signatures
  - Properties
  - Witness
- Interpreter from Kenzo CDs to ACL2 Encapsulates

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Conclusions

- Content Dictionaries for the main mathematical structures used in Simplicial Algebraic Topology have been defined
- Interoperate with deduction systems in order to increase the reliability of the Kenzo system

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