1. Delta Sets and Simplicial Sets

A **delta set** consists of a collection of sets indexed by non-negative integers, each set containing n-simplices, equipped with face maps that link each n-simplex to its $(n-1)$-simplex faces. Delta sets are characterized by the presence of face maps but lack the degeneracy maps found in simplicial sets.

A **simplicial set** extends the structure of delta sets by including both face maps and degeneracy maps. The degeneracy maps introduce redundancy by allowing simplices to include repeated vertices, providing a richer structure for modeling complex topological spaces.

2. Generality in Mathematical Structures

The discussion clarified the meaning of "generality" within mathematical contexts. A structure or category can be considered more general if it includes another as a subcategory. This concept is exemplified in the relationship between delta sets and simplicial sets:

- Every simplicial set can be transformed into a delta set by applying a forgetful functor that omits the degeneracy maps. This makes the category of delta sets more general than that of simplicial sets, as it encompasses all simplicial sets as well as additional structures not confined by degeneracy maps.
- The generalization relationship is analogous to other mathematical structures, such as metric spaces being more general than Riemannian manifolds, and monoids being more general than groups.

3. Conclusion

This discussion highlights the importance of precise terminology in mathematics, especially in the context of category theory where the inclusion of one category within another defines relative generality. The notion of forgetting structure to achieve greater generality is fundamental to understanding the broader applicability of mathematical concepts.