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Generalized principal bundles

A “generalized principal bundle” for an ordinary 1-category will be defined as a certain category-valued pseudo-bimodule that, roughly speaking, is a filtered category in each of its total fibres. This definition provides a possible generalization of a version of the classical definition found in [1].

For any pseudo-bimodule, an explicit construction of a pointwise Kan extension will be given. This gives a concrete computation of certain weighted pseudo-colimits. The Kan extension is expressible as a pseudo-coequalizer and admits a right calculus of fractions under certain further hypotheses. The main result is that a bimodule is a generalized principal bundle if, and only if, its induced Kan extension preserves finite weighed pseudo-limits in a suitable sense.

Finally, we will discuss the extent to which 2-categories of indexed categories can be seen as classifying categories for generalized principal bundles.

REFERENCES:

- [1] Moerdijk, I. Classifying Spaces and Classifying Topoi, *Springer Lecture Notes in Mathematics* 1616 (1995).