wellpowered category

Canonical name	WellpoweredCategory
Date of creation	2013-03-22 16:03:36
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Owner	kompik (10588)
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Numerical id	9
Author	kompik (10588)
Entry type	Definition
Classification	msc 18A05
Synonym	wellpowered
Synonym	well-powered
Synonym	locally small
Related topic	Subobject
Defines	extremally wellpowered
Defines	regular wellpowered
Defines	cowellpowered
Defines	extremally cowellpowered
Defines	regulary cowellpowered

Wellpoweredness is a kind of smallness condition on a category.

Let M be a class of monomorphisms. A category is said to be *M-wellpowered* if for any object any class of parwise non-isomorphism M-subobjects is a set. (By a M-subobject of an object A we understand a pair (E, e), where $e : E \to A$ is a morphism belonging to M.) In other words, if we consider isomorphic objects as the same object, the class of all M-subobjects is a set.

More precisely, for any A there exists a set of M-subobjects (M_i, m_i), $i \in I$ such that for any extremal subobject (M, m) of the object A there exists $i \in I$ and an isomorphism $f : M_i \to M$ such that $m_i = m \circ f$.

If M is the class of all regular monomorphisms, extremal monomorphisms, monomorphisms, we speak about regular wellpowered, extremally wellpowered, wellpowered category.

`http://planetmath.org/DualityPrinciple`Dual notions: regular cowellpowered, extremally cowellpowered, cowellpowered category.

References

[1] J. Adámek, H. Herrlich, and G. Strecker. *Abstract and Concrete Categories.* Wiley, New York, 1990.