

Visual tegory Theory

Dmitry
Vostokov

rick y rick

$\text{Part}_4 \in \mathbb{C}^{\text{Parts}}$

Visual Category Theory Brick by Brick, Part 4: Using LEGO® to Teach Abstract Mathematics

Published by OpenTask, Republic of Ireland

Copyright © 2020 by OpenTask

Copyright © 2020 by Dmitry Vostokov

All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without the prior written permission of the publisher.

Product and company names mentioned in this book may be trademarks of their owners.

OpenTask books and magazines are available through booksellers and distributors worldwide. For further information or comments, send requests to press@opentask.com.

A CIP catalog record for this book is available from the British Library.

ISBN-13: 978-1912636433 (Paperback)

Revision 1.01 (May 2020)

Categories may not have objects as sets or arrows as functions. For example, in the category \mathcal{C} below, arrows are 2×2 matrices of numbers with arrow composition similar to matrix multiplication.

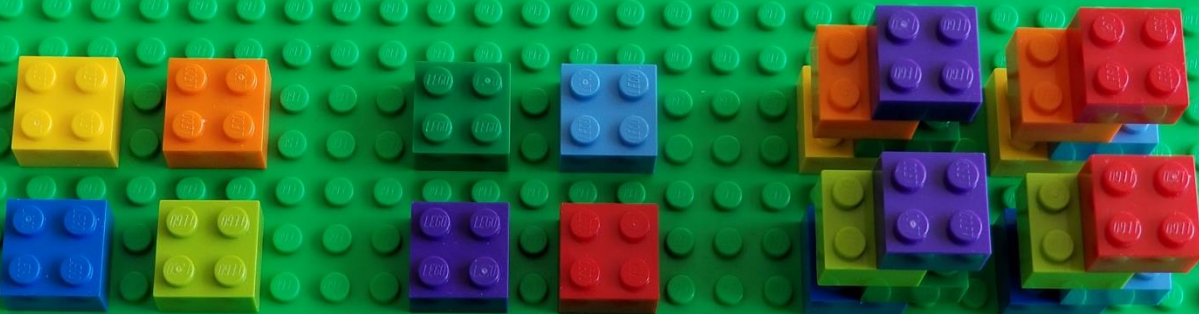
Numbers

$f \in \text{Ar}(\mathcal{C}) : A \rightarrow B$
 $A, B \in \text{Ob}(\mathcal{C})$
 $|A|, |B| = 2$
 A, B are any sets
with cardinality 2

$f \in \text{Ar}(\mathcal{C})$

$g \in \text{Ar}(\mathcal{C})$

$g \circ f \in \text{Ar}(\mathcal{C})$



In addition to 8 books mentioned in Part₁ and Part₃, we also used the following references:

- From Categories to Homotopy Theory by Birgit Richter
- From a Geometrical Point of View: A Study of the History and Philosophy of Category Theory by Jean-Pierre Marquis
- Machine Learning Brick by Brick, Epoch 1 by Dmitry Vostokov (algebraic notation for matrix multiplication)