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Visual category Theory

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$\text{Part}_1 \in C^{\text{Parts}}$

Visual Category Theory Brick By Brick, Part 1: Using LEGO® to Teach Abstract Mathematics

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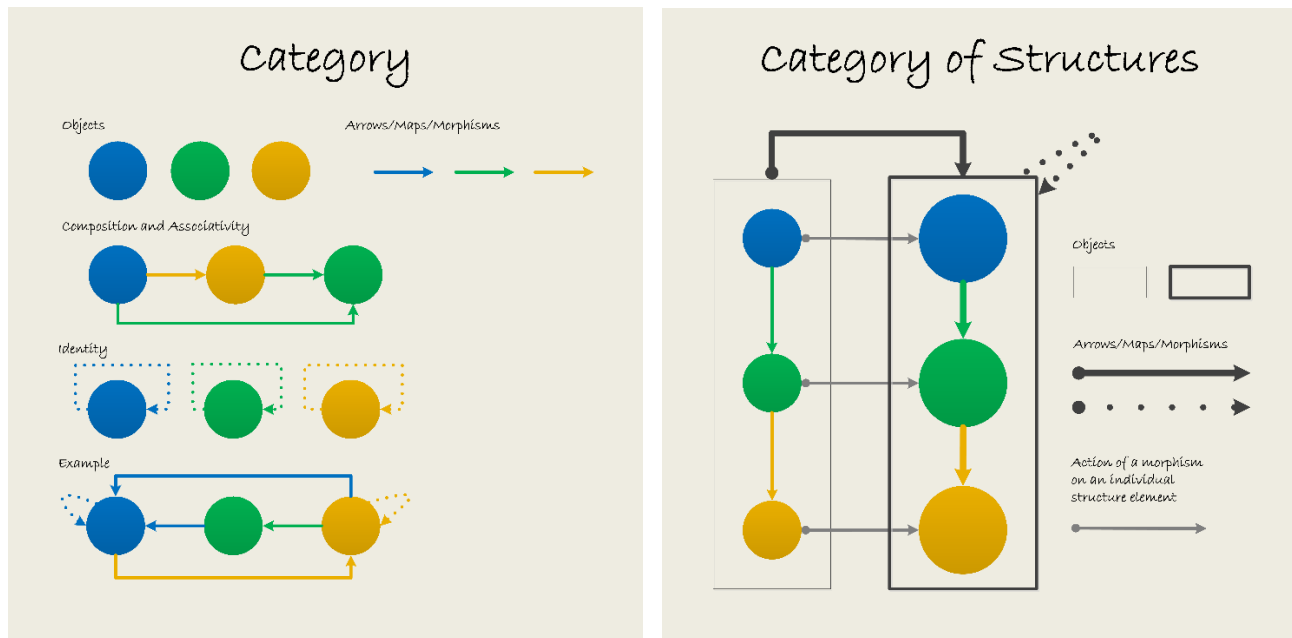
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Preface

Category theory abstractions are very challenging to apprehend correctly, require a steep learning curve for non-mathematicians, and, for people with traditional naïve set theory education, a paradigm shift in thinking. When reading various category theory textbooks, I found the lack of visual color examples, and, almost 3 years ago, in May 2017, I began working on a coffee table book. I made a few square slides shown below on this page, but then life got me carried away from writing. Recently, I started using LEGO® to teach machine learning and associated data structures and algorithms and found a way to represent directed graphs where I had to use arrows. Success with such representation struck me, and I realized that I could resume writing my previous visual category theory book but now using bricks instead of abstract circles.



For this part, I used the following books as a reference:

- An Introduction to Category Theory by Harold Simmons
- Category Theory and Applications: A Textbook for Beginners by Marco Grandis
- Modern Classical Homotopy Theory by Jeffrey Strom

A category \mathcal{C} consists of two collections

$Ob(\mathcal{C})$ - a collection of objects

$Ar(\mathcal{C})$ - a collection of arrows
(also called morphisms)