

An Introduction to Category Theory

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Introduction

The Roman numerals lack a zero and therefore are not abstract enough to signify nothing. The Roman numbers came from counting physical objects, zero came from questions about how to form counting systems. Interestingly, one of math's most abstract systems Category Theory arose from the habit of representing relations as diagrams on blackboards. While it's origins might be in the corporeal world of chalkboards and erasers, Category Theory is a field of mathematics that continues a long tradition to study math in the abstract.

1 Objects and Arrows

Arrows can be and usually are functions. Objects can be and usually are sets.

Definition 1. Definition for Category

1. A category consists of a class of Objects $\text{ob}(C)$
2. A class $\text{mor}(C)$ of arrows
3. A source
4. A target

Example 1. Use the Monoid $A(\mathbb{Z}, +)$ here.

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Definition 2. Lorem ipsum dolor sit amet, consectetur adipiscing tempor incididunt ut labore et dolore magna aliqua veniam, quis nostrud exercitation ullamcorper s commodo consequat.

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Theorem 1. *Duis autem vel eum iriure esse molestiae consequat, vel illum dolore eu fugi et iusto odio dignissim qui blandit praesent luptat exceptur sint occaecat cupiditat non provident, deserunt mollit anim id est laborum et dolor fuga distinct.*

2 Functors and Natural Transformations

Applying Theorem ?? to Definition ??, it follows that ipsum. This was previously established in [?] and [?, ?].

Theorem 2. *X is a functor*

Proof. Proof that X is a functor

□