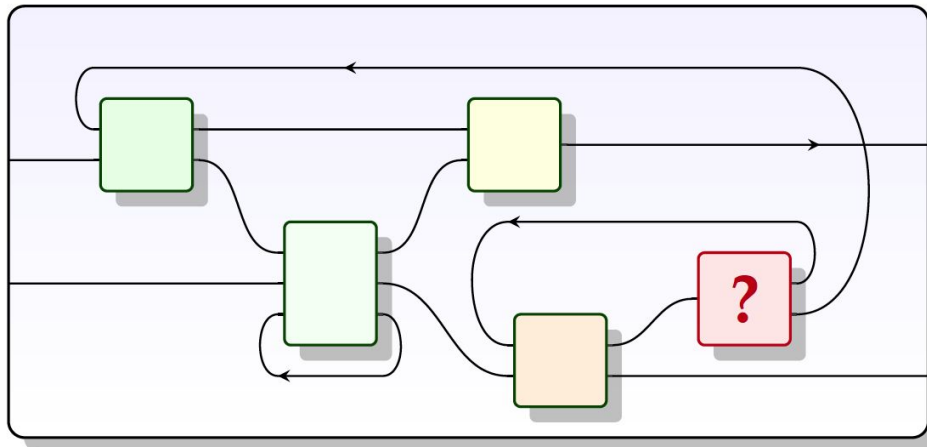


Seven Sketches in Compositionality

An Invitation to Applied Category Theory

IAP 2019 – 18.S097



Summary: Category theory is a relatively new branch of mathematics that has transformed much of pure math research. The technical advance is that category theory provides a framework in which to organize formal systems and translate between them, allowing one to transfer knowledge from one field to another. But the same organizational framework also has many compelling examples outside of pure math. In this course, we will give seven sketches about real-world applications of category theory. We'll teach from our recent book on the subject, which is available online (<https://arxiv.org/abs/1803.05316>).

Dates: January 14 – February 1, 2019

Time: 2:00 – 3:00 pm, MTWRF

Location: Room 2-142

Instructors: David Spivak and Brendan Fong

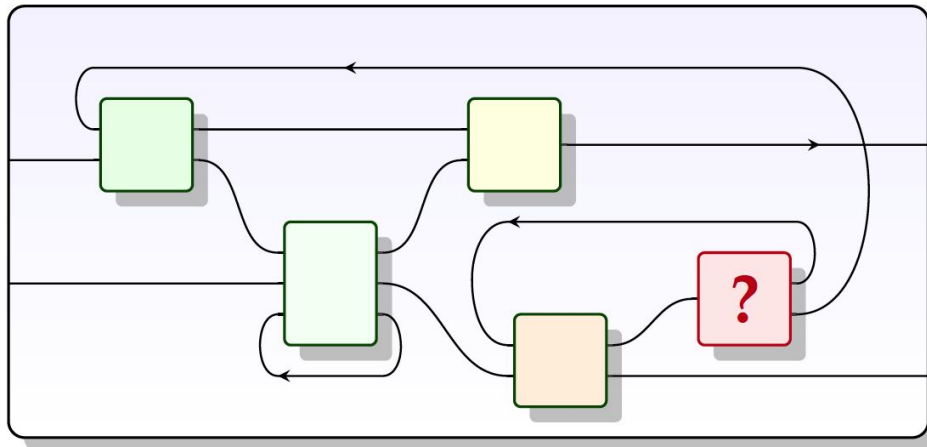
Credit/audit: For credit (3 units), sign up for 18.S097. You are also invited to audit.

URL: <http://brendanfong.com/7sketches.html>

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Applications

Cascade effects
Resource theory
Data transformation
Collaborative design
Signal flow graphs
Electrical circuits
A logic of behavior

Category theoretic notions

Posets and adjunctions
Monoidal posets and categorification
Categories, functors, and universal constructions
Enriched categories and profunctors
Props and graphical proof systems
Wiring diagrams, operads, and functorial semantics
Sheaves, toposes, and internal languages

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