

Introduction to Quantum Programming and Semantics

Lecture 8: Classical data

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Overview

- Qiskit
- Frobenius algebras
- Spiders
- Phases

Frobenius algebras

Copying orthonormal bases

Interacting monoid and comonoid

Classical structure

Self-duality

Spiders

Normal form

Spiders

Phases

Phases

Phased spider theorem

Phase group

Summary:

- Qiskit is fairly low-level circuit description language
- Frobenius law is extreme form of 'only connectivity matters'
- Can equivalently think of classical data as spiders
- Spiders can carry phases around