

# IQC Final Project Guidelines

Quantum Computing at Berkeley

November 18, 2019

**This final project is due 11:59 pm Friday, December 13th.**

## Option 1: Paper

The purpose of this final project is to demonstrate what you've gotten out of this class by exploring material related to quantum computing beyond what we've done in lecture. You may choose any QC related topic you'd like, as long as we have *not* lectured on it. The following is a short list of possible topics:

- Any algorithm from <https://quantumalgorithmzoo.org> that we have not already seen in class
- Quantum Approximate Optimization Algorithm
- Variational Quantum Eigensolver
- Hamiltonian Simulation
- Quantum Annealing
- Quantum Machine Learning
- Tensor Networks
- Ion traps
- Topological QC
- Superconducting qubits
- Error Correction
- Quantum Cryptography
- Solovay-Kitaev theorem
- Complexity Theory (Focus on BQP)

Your task is to write a two page review of your chosen topic.

## Option 2: Code

If you'd like to further explore Cirq you may choose to do so as your final project.

The goal will be to implement any quantum algorithm other than Deutsch's or Grover's. You should consult the examples available at <https://github.com/quantumlib/Cirq/tree/master/examples> for what general implementations look like. If the algorithm you want to implement is already present there, you should implement a circuit for a *specific instance* of the problem your algorithm solves, entirely using code that you have written yourself (in other words, don't just use some function/class from the Cirq examples folder).

The preferred method of submission for this option is hosting your code on github and sending us a link.