Cirq Basics

State Representations

Concept	Example
Creating a vector.	Python `vec = [1,0]`
Putting a vector in ket notation.	Python `cirq.dirac_notation(vec)`
Placing a vector on the Bloch Sphere	Python `bloch_sphere.BlochSphere(state_vector = vec)`
Finding the final state vector of a quantum circuit.	Python `sv = cirq.final_state_vector(my_circuit)`

Creating a histogram of state measurements. **NOTE**: You must specify how many qubits are in your circuit in the part: `tick_label=binary_labels(NUM QUBITS)`.	Python
	`hist = cirq.plot_state_histogram(result, plt.subplot(), title = 'Qubit States', xlabel = 'States', ylabel = 'Occurrences', tick_label=binary_labels(2))`
	
	`plt.show()`

Creating Qubits

Concept	Example
Creating a Named Qubit	Python `my_qubit = cirq.NamedQubit("q0")`
Creating a list of qubits.	Python `my_qubits = [cirq.NamedQubit(“q0”), cirq.NamedQubit(“q1”), cirq.NamedQubit(“q2”)]`
Using the range() method.	Python `my_qubits = cirq.NamedQubit.range( 3 prefix = “q”)`

Quantum Circuits

Concept	Example
Creating a quantum circuit.	Python `my_circuit = cirq.Circuit()`

Simulating a quantum circuit.	Python
	`sim = cirq.Simulator()`
	`result = sim.run(my_circuit)`
	`result`

Repeating the simulation of a quantum circuit.	Python
	`sim = cirq.Simulator()`
	`result = simulator.run(my_circuit, repetitions=10)`
	`results`

Gates and Measurements

Concept	Example
Adding a measurement to a single qubit.	Python `my_circuit.append(cirq.measure(my_qubit))`
Adding an X gate to a single qubit.	

	Python `qc.append(cirq.X(cirq.NamedQubit("q0")))`
Adding a Z gate to a single qubit.	Python `qc.append(cirq.Z(cirq.NamedQubit("q0")))`
Adding an H gate to a single qubit.	Python `qc.append(cirq.H(cirq.NamedQubit("q0")))`
Adding a measurement to each qubit.	Python `my_circuit.append(cirq.measure(my_qubits)`
Adding a quantum gate to each qubit.	Python `my_circuit.append(cirq.X.on_each(my_qubits)`
Adding a CNOT gate to a quantum circuit.	Python `my_circuit.append(cirq.CNOT(cirq.NamedQubit("q0"), cirq.NamedQubit("q1")))`