CMPT 376 Project 2 Draft

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1. Written documentation

Code your first quantum circuit

Learn to code your first quantum circuit without downloading anything to your computer, by using Qiskit notebooks embedded within IBM Quantum Experience. While you can benefit from having some familiarity with Python and quantum computing, you can get a sense of the big picture without those prerequisites.

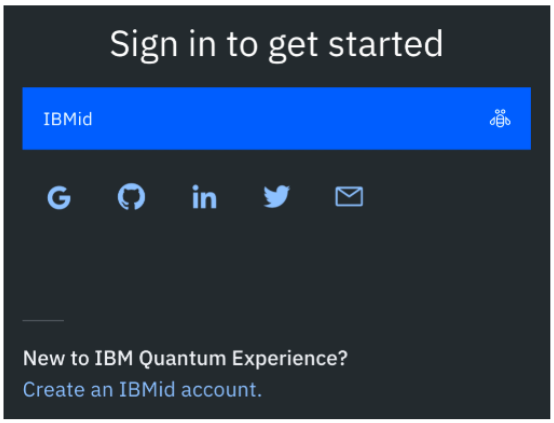
To code a quantum circuit with Qiskit, you follow three high-level steps:

- **Build**: design a quantum circuit that represents the problem you are considering.
- **Execute**: run experiments on different backends, either systems or simulators.
- **Analyze**: calculate summary statistics and visualize the results of experiments.

These instructions guide you through building a circuit with example code in a Qiskit Notebook, executing your program, and analyzing the results. You will then learn in greater detail how each component of the program functions.

Sign in to IBM Quantum Experience

1. Go to IBM Quantum Experience .
2. **Sign in** or **Create an IBMid account**.



2. Code documentation

Code Snippet 1

```
# Build
#------

# Create a Quantum Circuit acting on the q register
circuit = QuantumCircuit(2, 2)

# Add a H gate on qubit 0
circuit.h(0)

# Add a CX (CNOT) gate on control qubit 0 and target qubit 1
circuit.cx(0, 1)

# Map the quantum measurement to the classical bits
circuit.measure([0,1], [0,1])

# Execute
#--------

# Use Aer's qasm_simulator
simulator = Aer.get_backend('qasm_simulator')

# Execute the circuit on the qasm simulator
job = execute(circuit, simulator, shots=1000)

# Grab results from the job
result = job.result()

# Return counts
counts = result.get_counts(circuit)
print("\nTotal count for 00 and 11 are:",counts)

# Analyze
#--------

# Draw the circuit
circuit.draw()
```

```
Total count for 00 and 11 are: {'00': 479, '11': 521}
```

3. Community documentation