Quantum Computing Lab Evaluation

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[1]:
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# Importing standard Qiskit libraries
from qiskit import QuantumCircuit,
transpile from qiskit.visualization
import * from ibm_quantum_widgets
import *

# qiskit-ibmq-provider has been deprecated.
# Please see the Migration Guides in
 https://ibm.biz/provider_migration_guide␣ ↪for more detail.
from qiskit_ibm_runtime import QiskitRuntimeService, Sampler,
 Estimator,␣ ↪Session, Options

# Loading your IBM Quantum account(s)
service = QiskitRuntimeService(channel="ibm_quantum")

# Invoke a primitive. For more details see
 https://docs.quantum.ibm.com/run/ ↪primitives
# result = Sampler().run(circuits).result()
```

```
qiskit_runtime_service.__init__:INFO:2024-05-08 04:35:18,277:
Default instance: ibm-q/open/main
```

[2]:
```
from qiskit import *
from qiskit.visualization import plot_histogram
from qiskit_aer.primitives import Sampler
from qiskit_aer import AerSimulator
import pylatexenc

grover_circuit = QuantumCircuit(3)
def initialize_s(qc, qubits):
    for q in qubits:
        qc.h(q)
    return qc
grover_circuit = initialize_s(grover_circuit, [0,1,2])
grover_circuit.barrier()
grover_circuit.cz(0,2)
grover_circuit.cz(1,2)
grover_circuit.barrier()
```

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grover_circuit.h([0,1,2])
grover_circuit.x([0,1,2])
grover_circuit.ccz(0,1,2)
grover_circuit.x([0,1,2])
grover_circuit.h([0,1,2])
grover_circuit.barrier()
grover_circuit.measure_all()
grover_circuit.draw(output="mpl")
```

[2]: