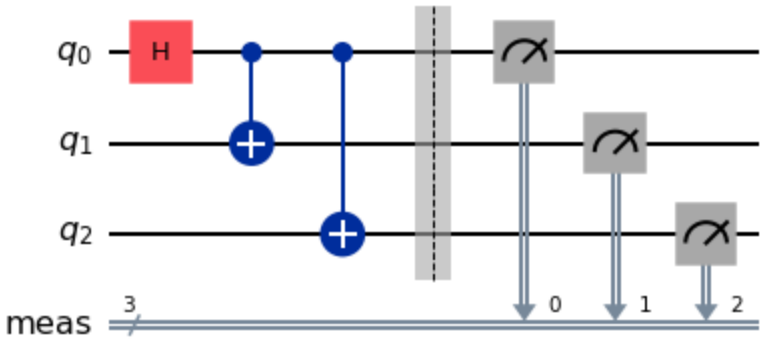
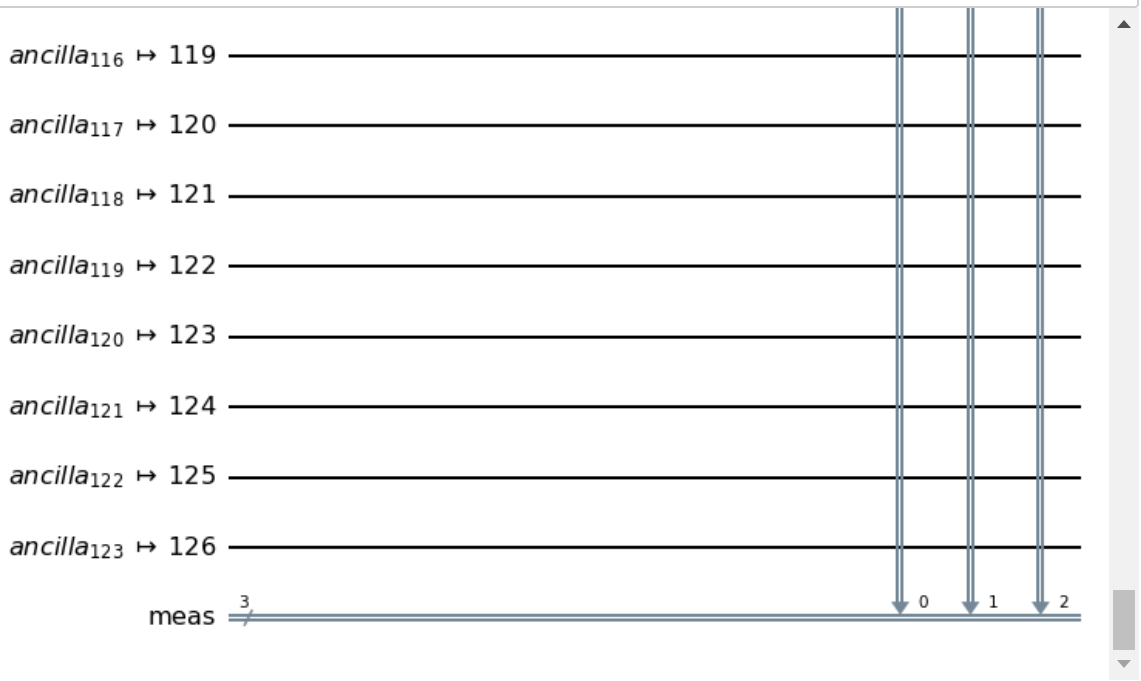
In [1]:
```
from qiskit import QuantumCircuit
from qiskit import transpile
from qiskit.visualization import plot_histogram

# Get a fake backend from the fake provider
from qiskit_ibm_runtime import QiskitRuntimeService
from qiskit_aer import AerSimulator
from qiskit_aer.noise import NoiseModel

# get a real backend from the runtime service
service = QiskitRuntimeService()
backend = service.get_backend('ibm_osaka')

noise_model = NoiseModel.from_backend(backend)

# Get coupling map from backend
coupling_map = backend.configuration().coupling_map
# Get basis gates from noise model
basis_gates = noise_model.basis_gates

# generate a simulator that mimics the real quantum system with the la
#backend_sim = AerSimulator.from_backend(backend)

# Perform a noise simulation
backend_sim = AerSimulator(noise_model=noise_model,
                           coupling_map=coupling_map,
                           basis_gates=basis_gates)
```

In [2]:
```
# Create a simple circuit
circuit = QuantumCircuit(3)
circuit.h(0)
circuit.cx(0,1)
circuit.cx(0,2)
circuit.measure_all()
circuit.draw('mpl', style="iqp")
```

Out[2]:

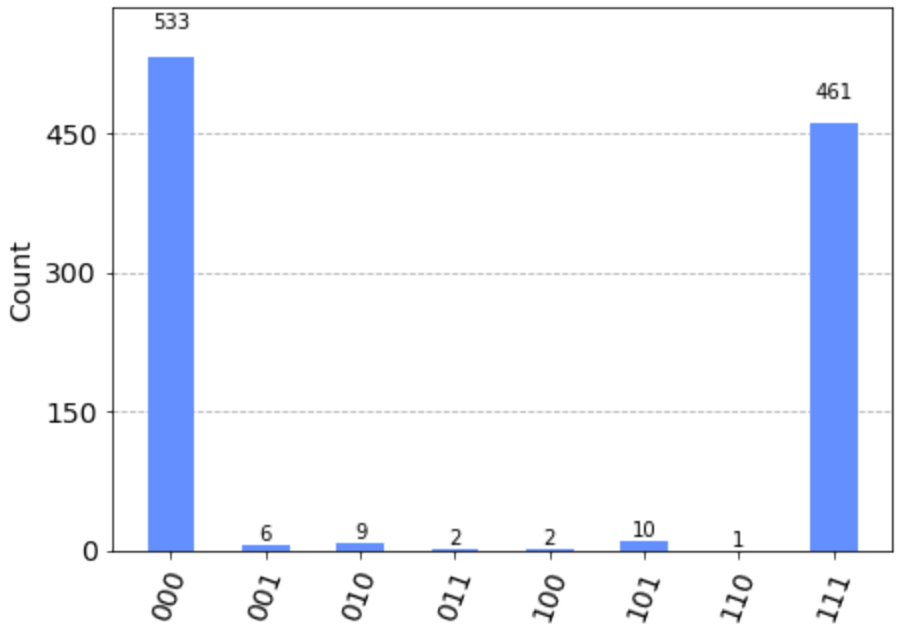


In [3]:
```
# Transpile the ideal circuit to a circuit that can be directly execut
transpiled_circuit = transpile(circuit, backend)
transpiled_circuit.draw('mpl', style="iqp")
```



In [4]:
```
# Run the transpiled circuit using the simulated fake backend
job = backend_sim.run(transpiled_circuit)
counts = job.result().get_counts()
plot_histogram(counts)
```

Out[4]:



In [5]:
```
pip list
```

```
python-lsp-jsonrpc                1.0.0
python-lsp-server                 1.2.4
python-slugify                    5.0.2
python-version                    0.0.2
pytz                              2021.3
PyWavelets                        1.1.1
pyxdg                             0.27
PyYAML                            6.0
pyzmq                             22.2.1
pyzstd                            0.15.9
QDarkStyle                        3.0.2
qiskit                            0.46.0
qiskit-aer                        0.14.0.1
qiskit-ibm-provider               0.8.0
qiskit-ibm-runtime                0.18.0
qiskit-terra                      0.46.0
qstylizer                         0.1.10
QtAwesome                         1.0.2
qtconsole                         5.1.1
QtPy                              1.10.0
```

In [ ]: