In [50]:

```
import numpy as np
from qiskit import *
from qiskit.visualization import plot_histogram
%matplotlib inline
qiskit.__qiskit_version__
```

Out[50]:

```
{'qiskit-terra': '0.16.4',
 'qiskit-aer': '0.7.5',
 'qiskit-ignis': '0.5.2',
 'qiskit-ibmq-provider': '0.11.1',
 'qiskit-aqua': '0.8.2',
 'qiskit': '0.23.6'}
```

In [142]:

```
circuit = QuantumCircuit(3, 3)
```

In [143]:

```
circuit.h(0)
circuit.cx(0, 1)
circuit.cx(0, 2)
circuit.barrier(range(3))
circuit.measure(range(3), range(3))
```

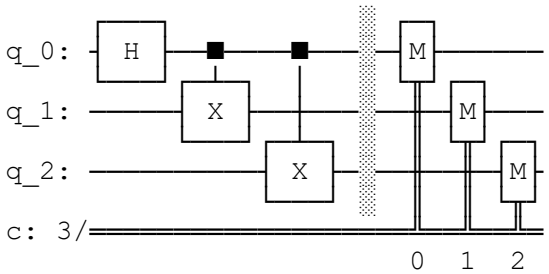
Out[143]:

```
<qiskit.circuit.instructionset.InstructionSet at 0x23b396ba550>
```

In [144]:

```
circuit.draw()
```

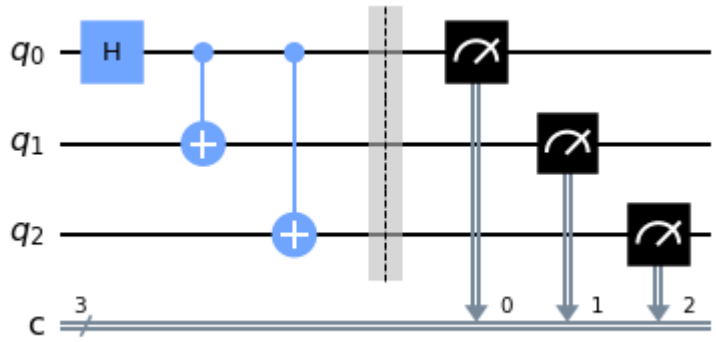
Out[144]:



In [145]:

```
circuit.draw('mpl')
```

Out[145]:

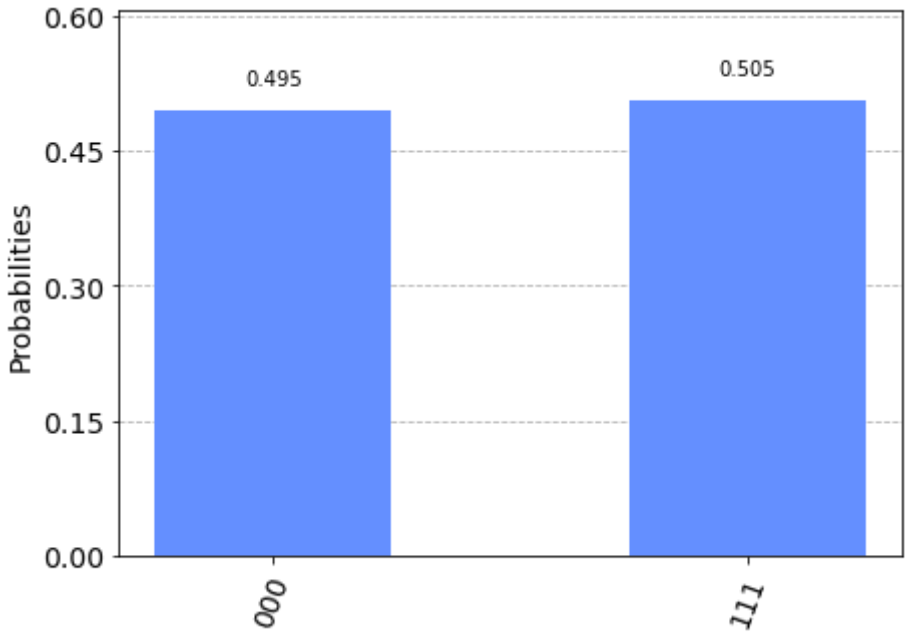


In [147]:

```
# Run the quantum circuit on a OPENQasm Simulator Backend
simulator = Aer.get_backend('qasm_simulator')
job = execute(circuit, simulator, shots = 1024)
result = job.result()
counts = result.get_counts(circuit)
print("\nTotal count for 000 and 111 are:", counts)
plot_histogram(counts)
```

```
Total count for 000 and 111 are: {'000': 507, '111': 517}
```

Out[147]:



In [148]:

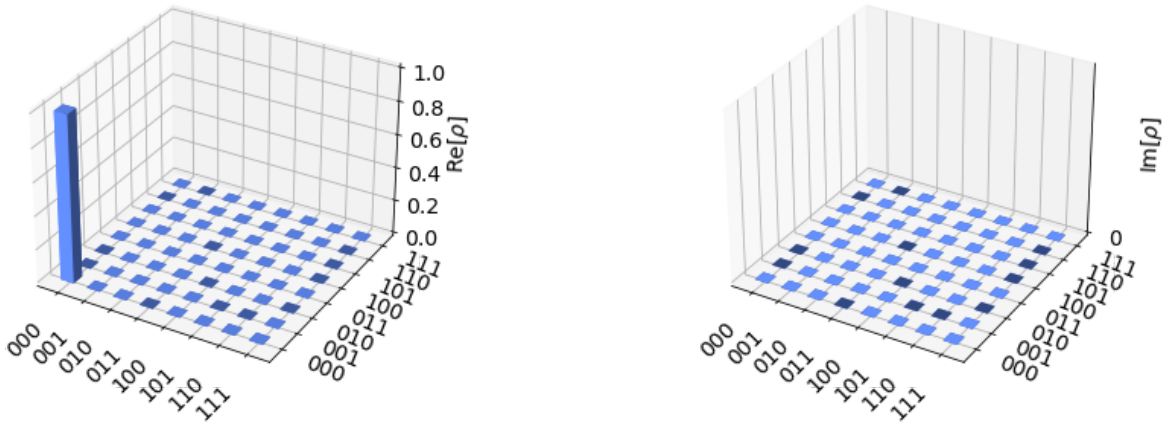
```
# Run the quantum circuit on a Statevector Simulator Backend
simulator = Aer.get_backend('statevector_simulator')
job = execute(circuit, simulator)
result = job.result()
output = result.get_statevector(circuit, decimals=3)
print(output)
```

```
[0.+0.j 0.+0.j 0.+0.j 0.+0.j 0.+0.j 0.+0.j 0.+0.j 1.+0.j]
```

In [151]:

```
from qiskit.visualization import plot_state_city
job = execute(circuit, simulator)
result = job.result()
output = result.get_statevector(circuit, decimals=3)
plot_state_city(output)
```

Out[151]:



In [152]:

```
# Run the quantum circuit on a Unitary Simulator Backend
# The quantum circuit should not have Measurement
circuit = QuantumCircuit(3, 3)
circuit.h(0)
circuit.cx(0, 1)
circuit.cx(0, 2)

simulator = Aer.get_backend('unitary_simulator')
job = execute(circuit, simulator)
result = job.result()
output = result.get_unitary(circuit, 3)
print(output)
```

```
[[ 0.70710678+0.00000000e+00j  0.70710678-8.65956056e-17j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j]
 [ 0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.70710678+0.00000000e+00j -0.70710678+8.65956056e-17j]
 [ 0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.70710678+0.00000000e+00j  0.70710678-8.65956056e-17j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j]
 [ 0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.70710678+0.00000000e+00j -0.70710678+8.65956056e-17j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j]
 [ 0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.70710678+0.00000000e+00j  0.70710678-8.65956056e-17j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j]
 [ 0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.70710678+0.00000000e+00j -0.70710678+8.65956056e-17j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j]
 [ 0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.70710678+0.00000000e+00j  0.70710678-8.65956056e-17j]
 [ 0.70710678+0.00000000e+00j -0.70710678+8.65956056e-17j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j
   0.        +0.00000000e+00j  0.        +0.00000000e+00j]]
```