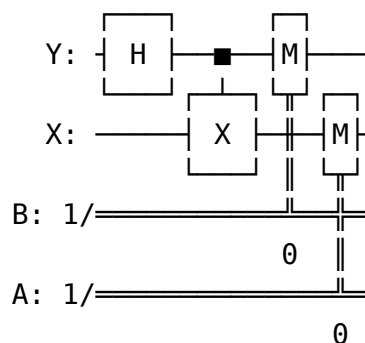
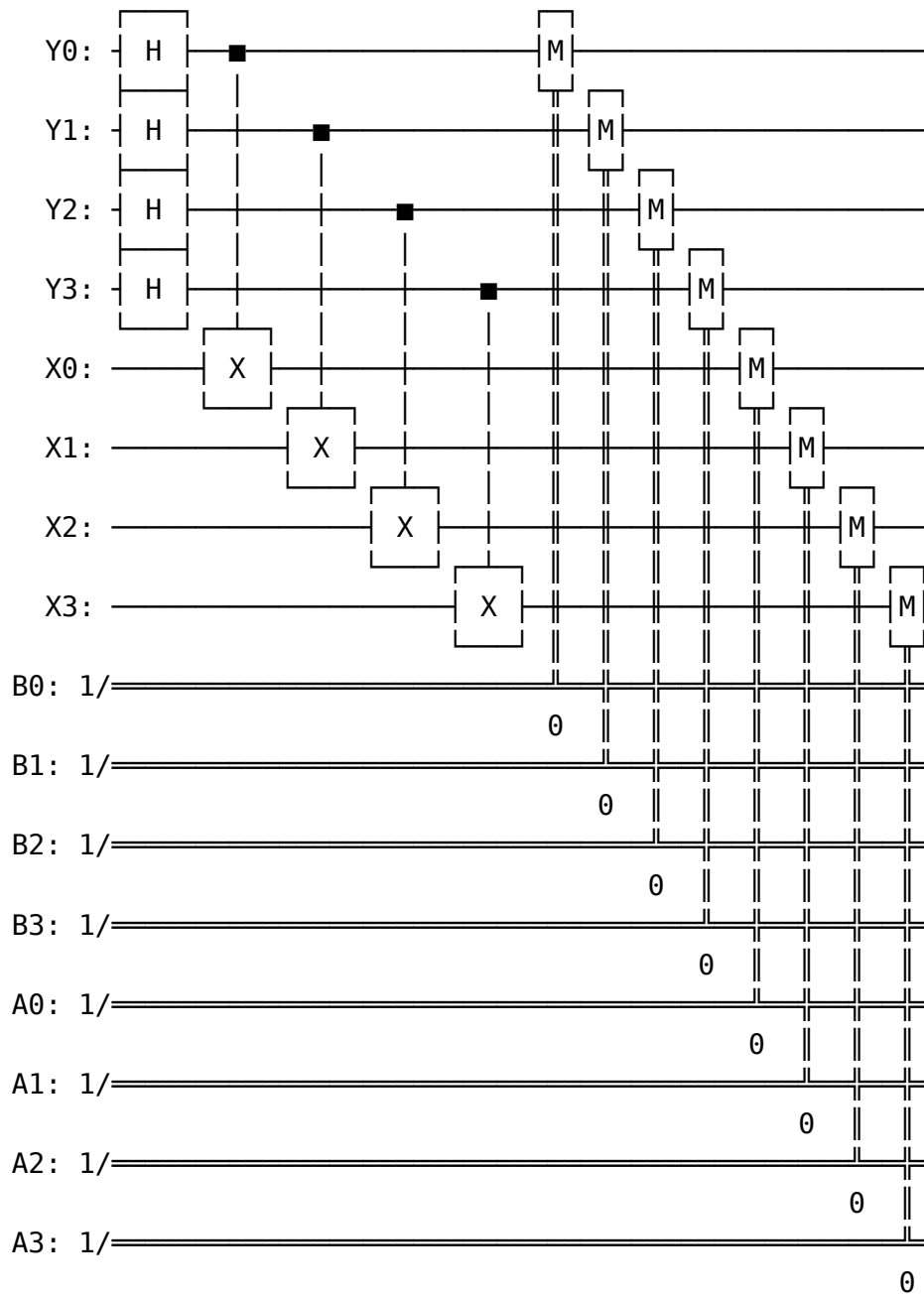


```
In [1]: 1 from qiskit import QuantumCircuit, QuantumRegister, ClassicalReg:  
2 from qiskit.primitives import Sampler  
3 from qiskit.visualization import plot_histogram
```

```
In [2]: 1 X = QuantumRegister(1, "X")  
2 Y = QuantumRegister(1, "Y")  
3 A = ClassicalRegister(1, "A")  
4 B = ClassicalRegister(1, "B")  
5  
6 circuit = QuantumCircuit(Y, X, B, A)  
7 circuit.h(Y)  
8 circuit.cx(Y, X)  
9 circuit.measure(Y, B)  
10 circuit.measure(X, A)  
11  
12 display(circuit.draw())
```



```
In [8]: 1 from qiskit import QuantumCircuit, QuantumRegister, ClassicalRegister
2 from qiskit.primitives import Sampler
3 from qiskit.visualization import plot_histogram
4 X0 = QuantumRegister(1, "X0")
5 Y0 = QuantumRegister(1, "Y0")
6 X1 = QuantumRegister(1, "X1")
7 Y1 = QuantumRegister(1, "Y1")
8 X2 = QuantumRegister(1, "X2")
9 Y2 = QuantumRegister(1, "Y2")
10 X3 = QuantumRegister(1, "X3")
11 Y3 = QuantumRegister(1, "Y3")
12 A0 = ClassicalRegister(1, "A0")
13 B0 = ClassicalRegister(1, "B0")
14 A1 = ClassicalRegister(1, "A1")
15 B1 = ClassicalRegister(1, "B1")
16 A2 = ClassicalRegister(1, "A2")
17 B2 = ClassicalRegister(1, "B2")
18 A3 = ClassicalRegister(1, "A3")
19 B3 = ClassicalRegister(1, "B3")
20
21 circuit = QuantumCircuit(Y0, Y1, Y2, Y3, X0, X1, X2, X3, B0, B1,
22 circuit.h(Y0)
23 circuit.h(Y1)
24 circuit.h(Y2)
25 circuit.h(Y3)
26 circuit.cx(Y0, X0)
27 circuit.cx(Y1, X1)
28 circuit.cx(Y2, X2)
29 circuit.cx(Y3, X3)
30 circuit.measure(Y0, B0)
31 circuit.measure(Y1, B1)
32 circuit.measure(Y2, B2)
33 circuit.measure(Y3, B3)
34 circuit.measure(X0, A0)
35 circuit.measure(X1, A1)
36 circuit.measure(X2, A2)
37 circuit.measure(X3, A3)
38 display(circuit.draw())
39
```



```
In [10]: 1 from qiskit import QuantumCircuit, QuantumRegister, ClassicalRegi
2 from qiskit.primitives import Sampler
3 from qiskit.visualization import plot_histogram
4
5 X0 = QuantumRegister(1, "X0")
6 Y0 = QuantumRegister(1, "Y0")
7 X1 = QuantumRegister(1, "X1")
8 Y1 = QuantumRegister(1, "Y1")
9 X2 = QuantumRegister(1, "X2")
10 Y2 = QuantumRegister(1, "Y2")
11 X3 = QuantumRegister(1, "X3")
12 Y3 = QuantumRegister(1, "Y3")
13
14 A0 = ClassicalRegister(1, "A0")
15 B0 = ClassicalRegister(1, "B0")
16 A1 = ClassicalRegister(1, "A1")
17 B1 = ClassicalRegister(1, "B1")
18 A2 = ClassicalRegister(1, "A2")
19 B2 = ClassicalRegister(1, "B2")
20 A3 = ClassicalRegister(1, "A3")
21 B3 = ClassicalRegister(1, "B3")
22
23 circuit = QuantumCircuit(Y0, X0, B0, A0, Y1, X1, B1, A1, Y2, X2,
24
25 circuit.h(Y0)
26 circuit.h(Y1)
27 circuit.h(Y2)
28 circuit.h(Y3)
29 circuit.cx(Y0, X0)
30 circuit.cx(Y1, X1)
31 circuit.cx(Y2, X2)
32 circuit.cx(Y3, X3)
33
34 circuit.measure(Y0, B0)
35 circuit.measure(Y1, B1)
36 circuit.measure(Y2, B2)
37 circuit.measure(Y3, B3)
38 circuit.measure(X0, A0)
39 circuit.measure(X1, A1)
40 circuit.measure(X2, A2)
41 circuit.measure(X3, A3)
42
43 display(circuit.draw())
44
```

