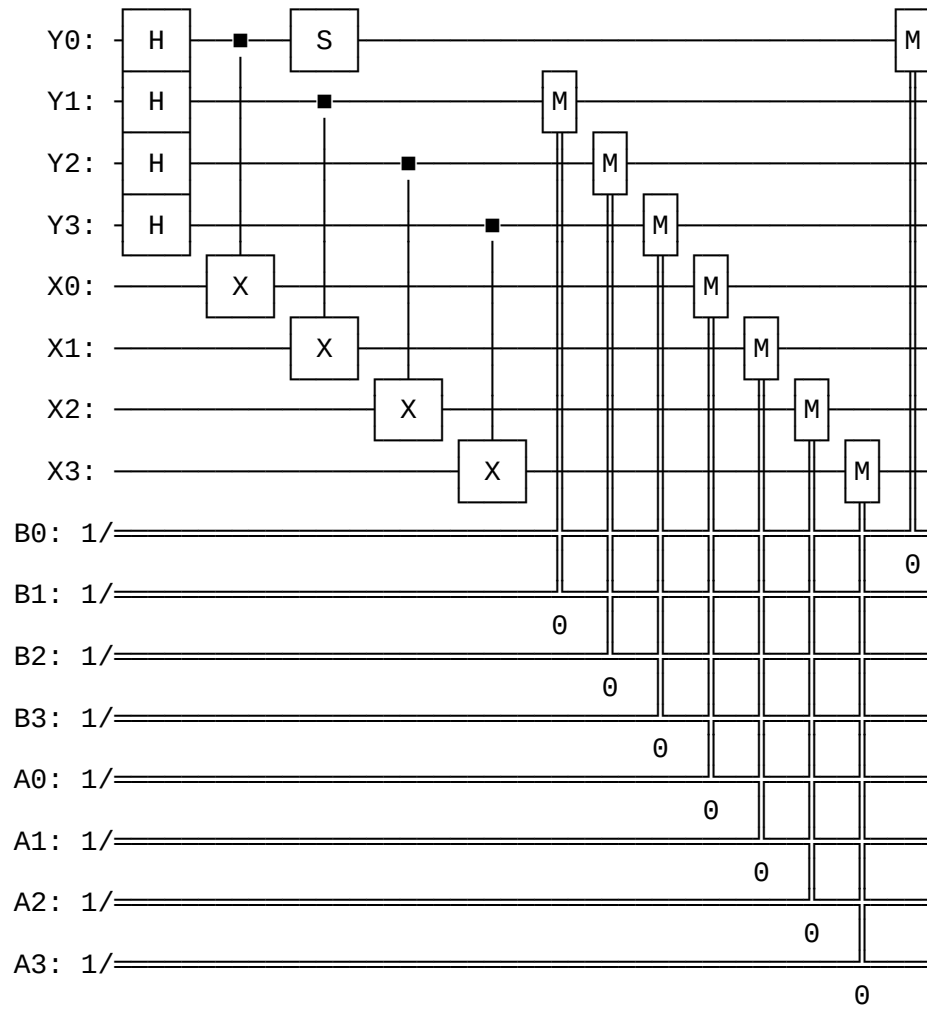
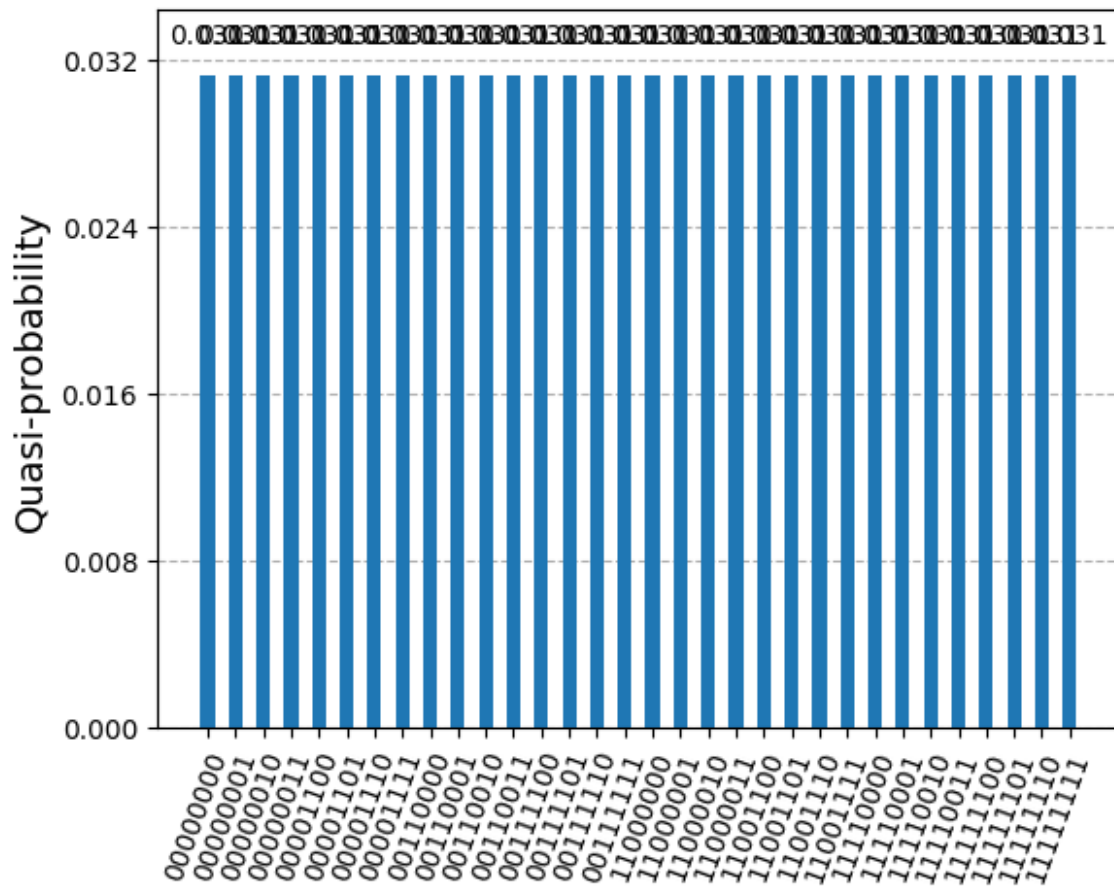
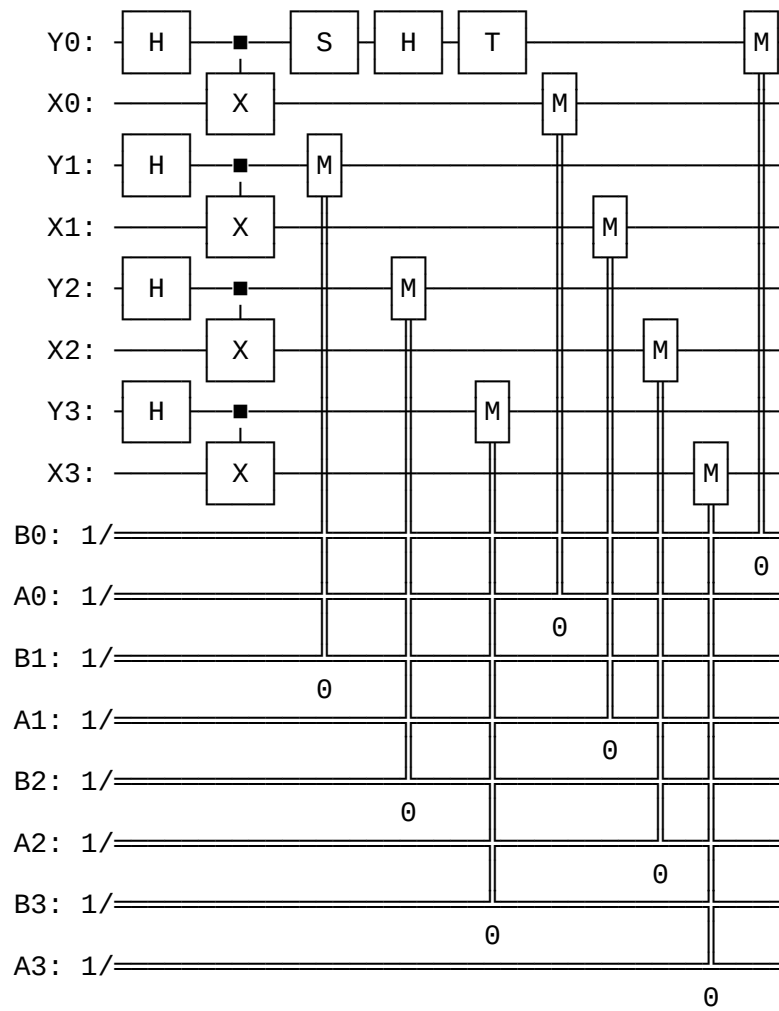


```
In [4]: 1 from qiskit import QuantumCircuit, QuantumRegister, ClassicalRegister
2 from qiskit.primitives import Sampler
3 from qiskit.visualization import plot_histogram
4 X0 = QuantumRegister(1, "X0")
5 Y0 = QuantumRegister(1, "Y0")
6 X1 = QuantumRegister(1, "X1")
7 Y1 = QuantumRegister(1, "Y1")
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.s(Y0)
28 circuit.cx(Y1, X1)
29 circuit.cx(Y2, X2)
30 circuit.cx(Y3, X3)
31 circuit.measure(Y0, B0)
32 circuit.measure(Y1, B1)
33 circuit.measure(Y2, B2)
34 circuit.measure(Y3, B3)
35 circuit.measure(X0, A0)
36 circuit.measure(X1, A1)
37 circuit.measure(X2, A2)
38 circuit.measure(X3, A3)
39 display(circuit.draw())
40
```



```
In [3]: 1 from qiskit import QuantumCircuit, QuantumRegister, ClassicalRegister
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 circuit.s(Y0)
34 circuit.h(Y0)
35 circuit.t(Y0)
36
37 circuit.measure(Y0, B0)
38 circuit.measure(Y1, B1)
39 circuit.measure(Y2, B2)
40 circuit.measure(Y3, B3)
41 circuit.measure(X0, A0)
42 circuit.measure(X1, A1)
43 circuit.measure(X2, A2)
44 circuit.measure(X3, A3)
45
46 display(circuit.draw())
47
48 results = Sampler().run(circuit).result()
49 statistics = results.quasi_dists[0].binary_probabilities()
50 display(plot_histogram(statistics))
51
```



In []: 1