State Diagrams

- N Flip Flops: $2^N$ States
- Binary State is Word $Q_N \ldots Q_1 Q_0$
- $Q_N$ is “msb”, $Q_0$ is “lsb”
- No. of Possible Diagrams $= 2^N \cdot 2^N$
Possible State Diagrams: $N = 1$
Ripple Counter

```
D Q
CK Q
```

LSB

```
D Q
CK Q
```

MSB
Ripple Counter: State Diagram

000 → 111 → 110 → 101 → 100 → 011 → 010 → 001
Synchronous Counter
Divide-By-Three Counter
3 State Diagram ($Q_1 Q_0$)