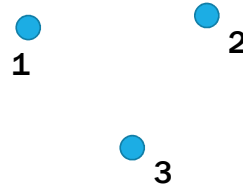
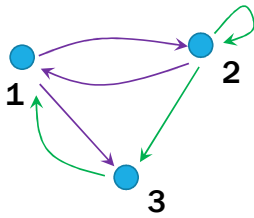


## Combining Relations

If  $S = \{(2, 2), (2, 3), (3, 1)\}$  and  $R = \{(1, 2), (2, 1), (1, 3)\}$

Compute  $S \circ R$  i.e. every pair  $(a, c)$  with a  $b$  with  $(a, b) \in R$  and  $(b, c) \in S$



## Design some DFAs

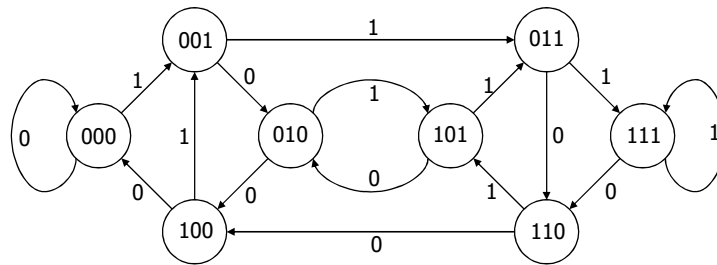
Let  $\Sigma = \{0,1,2\}$

$M_1$  should recognize "strings with an even number of 2's."

What do you need to remember?

$M_2$  should recognize "strings where the sum of the digits is congruent to 0 (mod 3)"

## 3 bit shift register "Remember the last three bits"



What language does this machine recognize?

