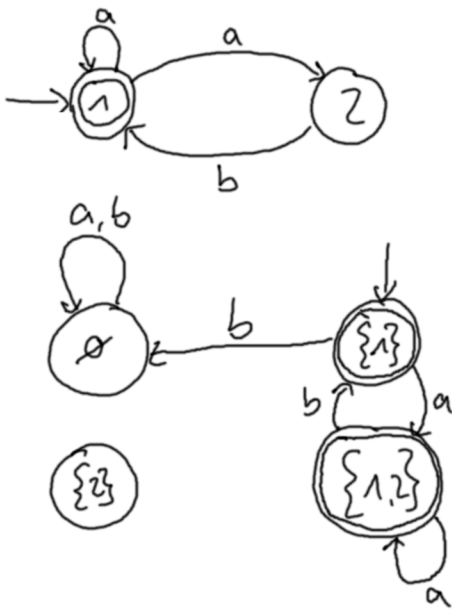
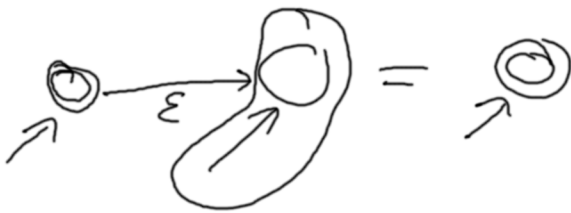
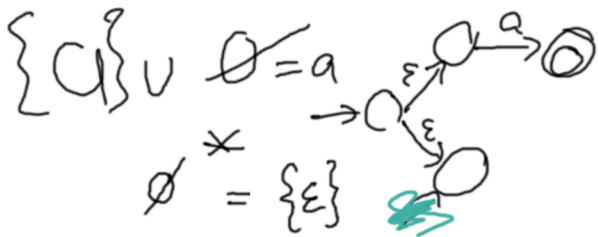


# Derandomization example



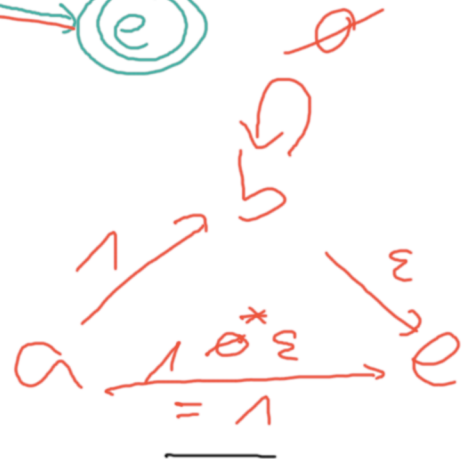
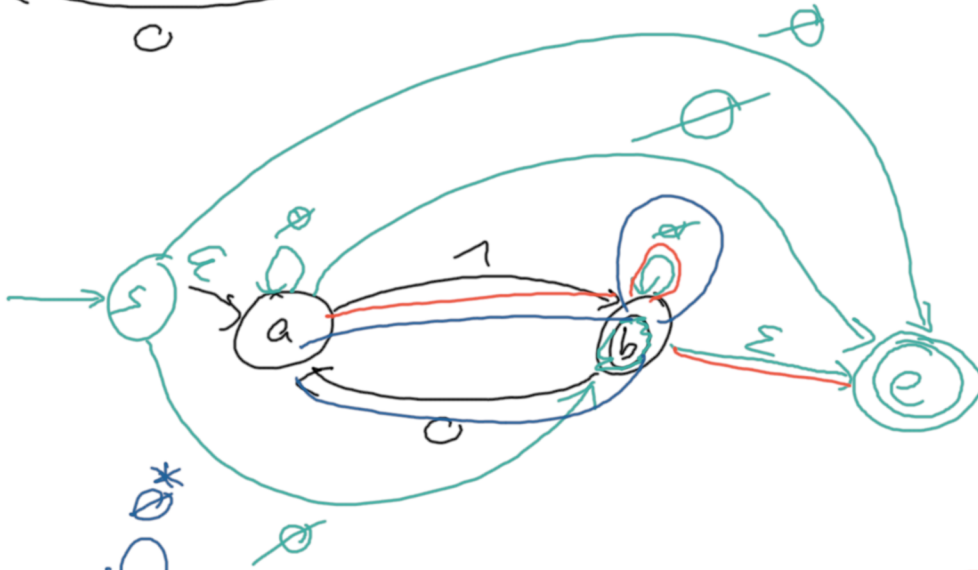
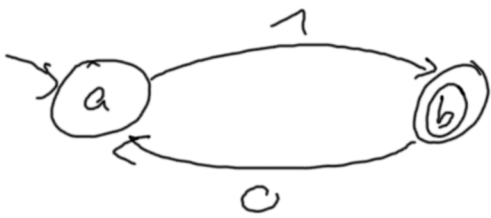
- Derandomization recipe:
1. power states
  2. start & accepting states
  3. transitions to the set of reachable states
  4. simplify

## Visualizing operations with $\emptyset$



concat:

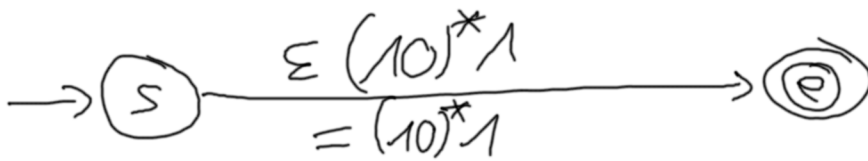




rip out b:



rip out a:



$$L = \{0^n 1^n \mid n \in \mathbb{N}_0\}$$

### Pumping Lemma Recipe:

1. Assume for  $\Leftarrow$  that  $L$  is reg.

2.  $\Rightarrow$  PL holds,  $\exists p$ .

3. Choose  $w = 0^p 1^p$ , which is  $|w| \geq p$

4. Consider all  $w = xyz$ , s.t.

$$|xy| \leq p, |y| \geq 1$$

$$\Rightarrow y \in 0^+$$

$$\Rightarrow xy^p z = xz = 0^{n-|y|} 1^n \notin L \Leftarrow$$

5. Contradiction  $\Rightarrow L$  not reg.

