Closure under Union

- Theorem: If A and B are regular languages, then is also regular language $A \cup B$
- Proof.
  Let A be accepted by finite automata N1, and
  B be accepted by finite automata N2

Find another finite automata N to accept $A \cup B$

1

Construct N

- N1:

- N2:

2

Construct N

- N accepts iff one of N1 and N2 accepts

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Closure under Catenation

- Theorem: If A and B are regular languages, then is also a regular language $A \circ B$
- Proof.
  Let A be accepted by finite automata N1, and
  B be accepted by finite automata N2

Find another finite automata N to accept $A \circ B$

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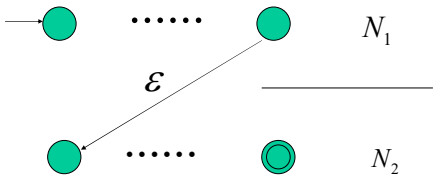
Construct N



- N2 is linked to the accept state of N1

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Problem

- Design an automata for 10*1.
- Design an automata for recognizing all strings 1^{2k+1}
- Link the above two automatas for recognizing

$$10^*1 \cup \{1^{2k+1} : k \geq 0\}.$$

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