- Continue §1.1 of \([Sip]\)

- The cost of excluding \(E\) from \(\{0, 3, 6, 9, 00, 03, 06, 09, 12, 15, \ldots\}\)

- More on DFA’s

- \(A \cup B, A \cap B, A \circ B, A^*\)

- Why \(A \circ B\) and \(A^*\) are awkward with DFA’s

  e.g., \(\{a^3, a^5\}^*\)

- Start §1.2 of \([Sip]\)

- NFA’s: non-determinism

- How they help with \(A \circ B\), \(A^*\)
Breakout Room Questions:

1. Give a DFA that recognizes
   (a) \{\varepsilon, 0, 2, 4, 6, 8, 00, 02, 04, 06, 08, 10, 12, 14, \ldots\}

   (b) Same, but exclude \varepsilon

   (c) "  "  "  " \varepsilon and do not allow leading 0's

2. Give a DFA that recognizes
   \{0, 3, 6, 9, 12, 15, 18, 21, \ldots\}

3. Is there a DFA that recognizes
   \{0, 7, 14, 21, 28, 35, 42, \ldots\}
4) How many states needed to recognize \( \{a^5, a^7\} \) by a DFA

5) How many states needed to recognize \( \{a^5, a^7\}^* \) by a DFA

6) How many states needed to recognize \( \{a^5, a^7\}^* \) by an NFA

7) If an NFA has 1000 states, its corresponding DFA may have roughly \( 2^{1000} \) states. Is there a relatively quick way to see if the NFA accepts a given string?