

CPSC 421/501

- Continue § 1.1 of [Sip]

- The "cost" of excluding ϵ from $\{0, 3, 6, 9, 00, 03, 06, 09, 12, 15, \dots\}$

- 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) $\{ \varepsilon, 0, 2, 4, 6, 8, 00, 02, 04, 06, 08, 10, 12, 14, \dots \}$

(b) Same, but exclude ε

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

(2) Give a DFA that recognizes

$\{ 0, 3, 6, 9, 12, 15, 18, 21, \dots \}$

(3) Is there a DFA that recognizes

$\{ 0, 7, 14, 21, 28, 35, 42, \dots \}$

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?

