University of California, Santa Barbara

CMPSC 138 SUMMER 2018

Homework III: Due Wednesday, August 22, during the discussion session.

1. Do Problem 6, Section 2.1 of the text.
2. Do Problem 13, Section 2.1 of the text.
3. Do Problem 5, Section 2.2 of the text.
4. Do Problem 5, Section 2.3 of the text.
5. Do Problem 14, Section 2.3 of the text.
6. Do Problem 17, Section 2.3 of the text.
7. Do Problem 19, Section 3.1 of the text.
8. Convert the NFA $N = (\{q_0, q_1, q_2\}, \{a, b\}, \delta, q_0, \{q_1\})$ where δ is given by

δ	a	b	λ
q_0	$\{q_1\}$	ϕ	$\{q_1\}$
q_1	$\{q_0, q_2\}$	$\{q_1, q_2\}$	ϕ
q_2	$\{q_2\}$	$\{q_1\}$	ϕ

   into an equivalent DFA.
9. Do Problem 20, Section 3.1 of the text.
10. Let $\Sigma = \{0, 1\}$. We can view a $\Sigma-$string w which starts with the letter 1 as a binary number (where the rightmost character of the string is the least significant digit of the number). Construct transition diagrams of NFA accepting the following languages:
    (a) $\{w \in \Sigma^+ \mid w > 4\}$
    (b) $\{w \in \Sigma^+ \mid w$ is a power of 2 $\}$,
    (c) $\{w \in \Sigma^+ \mid w$ is even$\}$.