

Theory of Computation, CSCI 438 spring 2022
Properties of regular languages, pg. 44-47, Jan. 19

Exercise 1.5 c, d & g (page 84) and 1.4 a (page 83)

Exercise 1.5 For these first construct a DFAs for the complement of the language and then use the method presented in class to convert the DFA to one for the given language. For all $\Sigma = \{a, b\}$.

c. $\{w \mid w \text{ contains neither the substrings } ab \text{ nor } ba\}$

DFA for $\{w \mid w \text{ contains either the substrings } ab \text{ or } ba\}$

DFA for $\{w \mid w \text{ contains neither the substrings } ab \text{ nor } ba\}$

d. $\{w \mid w \text{ is any string not in } a^*b^*\}$

DFA for $\{w \mid w \text{ is any string in } a^*b^*\}$

DFA for $\{w \mid w \text{ is any string not in } a^*b^*\}$

g. $\{w \mid w \text{ is any string that doesn't contain exactly two a's}\}$

DFA for $\{w \mid w \text{ is any string that contains exactly two a's}\}$

DFA for $\{w \mid w \text{ is any string that doesn't contain exactly two a's}\}$

1.4 For these first construct DFAs for the two simpler languages, then combine them using the construction discussed to give the DFA for the language given. For all parts $\Sigma = \{a,b\}$.

- a. $\{w \mid w \text{ has at least three a's and at least two b's}\}$

$\{w \mid w \text{ has at least three a's}\}$

$\{w \mid w \text{ has at least two b's}\}$

Combined: