

**HW 1 Due: 1 sep 2017**

1. Give a regular expression, simplified to the best of your abilities, for the language of **all** strings of  $a$ 's,  $b$ 's, and  $c$ 's where  $a$  is never immediately followed by  $b$ . 30
2. Give a regular expression, simplified to the best of your abilities, for the language of **all** strings of  $a$ 's,  $b$ 's, and  $c$ 's that contain an even number of  $b$ 's. 30
3. Simplify (if possible) the expression  $(a + b + c)^*(a + b)^*$ , then describe as concisely as you can in English the language it defines. 30
4. Simplify (if possible) the expression  $(a + b)^*c^*(a + b)^*$ , then describe as concisely as you can in English the language it defines. 30
5. Define a DFA, simplified to the best of your abilities, for the language of **all** strings of  $a$ 's,  $b$ 's, and  $c$ 's where  $a$  is never immediately followed by  $b$ . 30
6. Define a DFA, simplified to the best of your abilities, that recognizes the language

$$L = \{w \in \{a, b\}^* : |w|_a \bmod 3 = 0\}.$$

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