

Homework Day #33  
COMP 2230  
Spring 2024  
Prof. Stucki

1) Construct a regular grammar for each of the following languages,  $\Sigma = \{a, b\}$ .

- a)  $\{w : w \text{ has an even length}\}$
- b)  $\{w : w \text{ contains the substring } abbb\}$
- c)  $\{w : w \text{ begins and ends with the same symbol}\}$
- d)  $\{w : |w| < 3\}$
- e)  $\{w : w \text{ contains no } b\text{'s}\}$
- f)  $\{baba\}$

2) Construct a regular expression for each of the languages in question 1.

3) Construct a finite state machine that recognizes the language generated by the following regular grammar:

$$\begin{aligned} S &\rightarrow aT \mid bR \\ T &\rightarrow aT \mid bR \mid \varepsilon \\ R &\rightarrow aT \mid bR \end{aligned}$$

4) Construct a finite state machine that recognizes the language described by the following regular expression:

$$a^*bba^*$$