

## Automata and formal languages

### Exercise

---

Answer the following questions and submit your report by next Tuesday.

1. Construct a DFA that accepts the language generated by the grammar

$$\begin{aligned}S &\longrightarrow abA, \\A &\longrightarrow baB, \\B &\longrightarrow aA|bb\end{aligned}$$

2. Construct right- and left-linear grammars for the language:

$$L = \{a^n b^m : n \geq 2, m \geq 3\}$$

3. Construct right- and left-linear grammars for the language generated by the following regular expression:

$$r = (aab^*ab)^*$$

4. Construct a context-free grammar for the language:

$$\{a^i b^j c^k : i \neq j \text{ or } j \neq k\},$$

that is the language of strings of  $a$ 's followed by  $b$ 's followed by  $c$ 's, such that there are either a different number of  $a$ 's and  $b$ 's or a different number of  $b$ 's and  $c$ 's, or both.