

## Assignment 1

*due Tuesday, October 10, 2023*

For each of the following languages, (i) give a DFA accepting it, as well as (ii) a regular expression describing it. The alphabet for all of them is  $\{a, b\}$ .

1.  $\{ w \mid w \text{ contains the substring } abab \}$
2.  $\{ w \mid w \text{ starts with an } a \text{ and has odd length, or starts with a } b \text{ and has even length} \}$
3.  $\{ w \mid w \text{ ends with the suffix } a^5 = aaaaa \}$
4.  $\{ w \mid \text{every odd position of } w \text{ is a } b \}$
5.  $\{ w \mid w \text{ contains at least two } a\text{'s and at most one } b \}$
6.  $\{\epsilon, a\}$