

Try to find the minimal solution (i.e. least number of states, shortest expressions).

Question 1

Construct a deterministic finite automaton for each of the following languages ($\Sigma = \{a, b\}$).

- (a) The set of strings that either begin or end (or both) with ab .
- (b) The set of strings where the number of a 's ≥ 1 (modulo 3).¹
- (c) The set of strings where every odd position is an a .
- (d) The set of strings with at least two a 's and at most one b .
- (e) The set of strings not in a^*b^* .

Question 2

Write regular expressions for the languages of Question 1.

¹See the entry "modulo operation" in Wikipedia, in case you are not familiar with modular arithmetic.