Automata, Computability and Formal Languages — Fall 2020
CS 3350 — L. Longpré

Homework 1, due 9/10/2020

1. Build Deterministic Finite Automata for the following languages over alphabet $\{a, b\}$:

   (a) Strings of length at least 3

   (b) Strings that do not contain the substring ba

   (c) Strings that have either exactly one a or exactly two a's.

2. Let an NFA be defined as $(Q, \Sigma, \delta, q_0, F)$ where

   - $Q = \{q_0, q_1, q_2\}$
   - $\Sigma = \{a, b\}$
   - q_0 is the start state
   - $F = \{q_1\}$
   - δ is given by

	a	b	ε
q_0	$\{q_2\}$	$\{q_0\}$	$\{q_1\}$
q_1	$\{q_2\}$	$\{q_0\}$	$\emptyset$
q_2	$\{q_0, q_2\}$	$\{q_1\}$	$\emptyset$

   Construct a DFA equivalent to this NFA following the algorithm we saw in class.