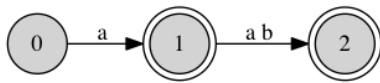


1.
 - a) Automata is deterministic
 - b) No, 'abba' is not a valid string
 - c) The string 'ba' is the shortest input that the automata rejects

2.

The first graph represents a union of both sets. That is, all strings in the second set already exist in the first.

3. Possible automata:



4. Regex:

$a (ba \mid b)^* a^*$