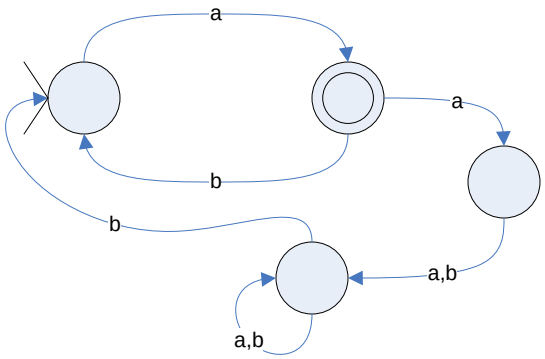
2.1.2

A

Samir Faci, HW4, CS301

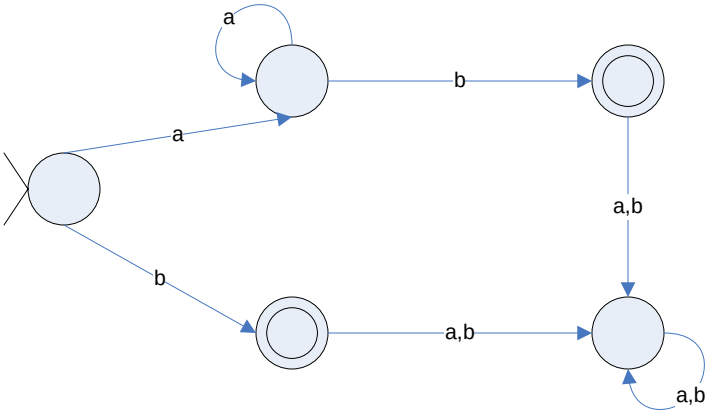
All filled circles are meant to be empty, ignore any dashed-lines.

This DFA will accept any string that starts with an a and will accept alternating occurances of a's and b's that will always end with an a or simply the string a. This DFA will fail on {e} as input.



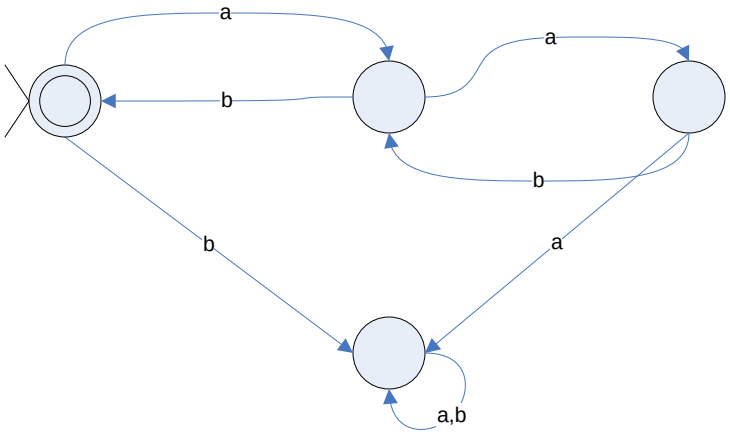
B

This DFA will accept the string b or any number of occurrences of a in a string that starts with a and is followed by a single occurrence of b. This DFA will fail on {e} as input.



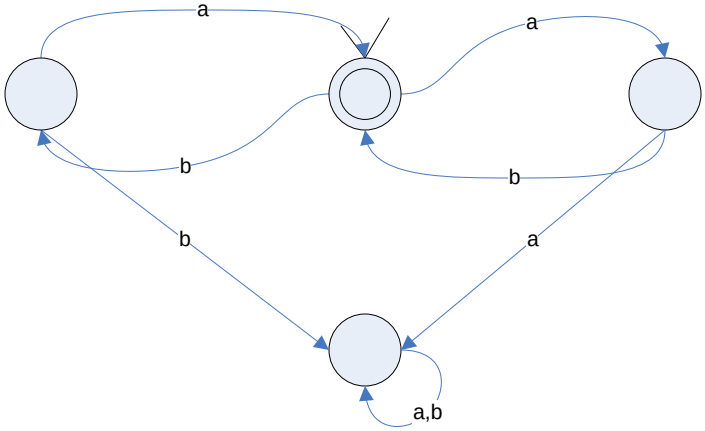
C

This DFA will take the string {e} or any strings starting with a containing alternating a's or b's in a single pair or even pairs (even pairs meaning aabb)



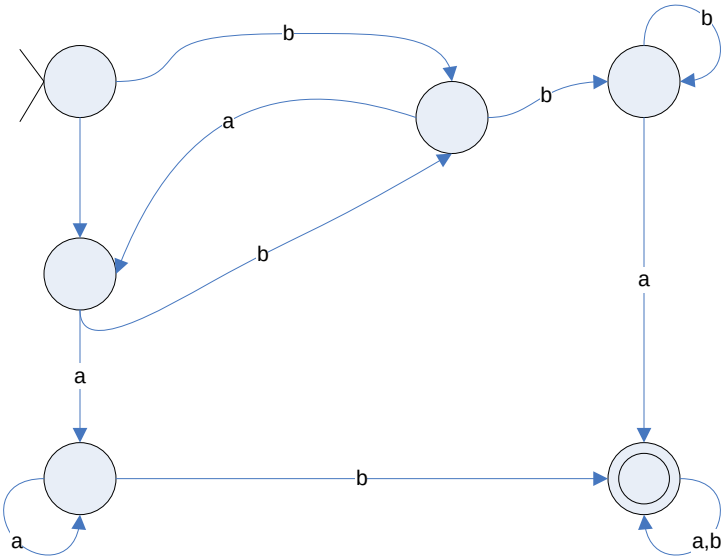
D

This DFA will start with either an ab or ba with alternating occurrences of all possible starting strings stated above have with an even number of chars in the final string. It will also accept {e} as input.



E

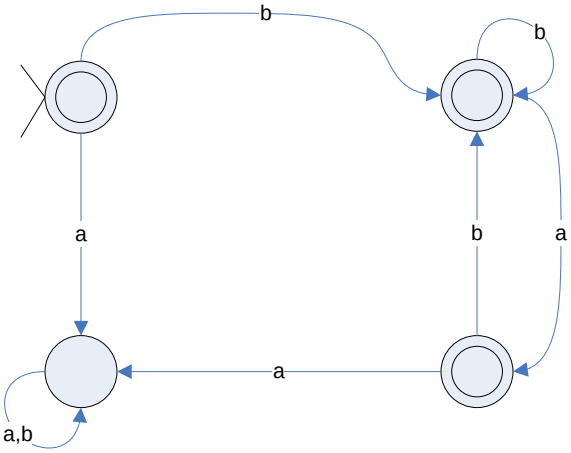
This DFA will accept any string starting with a or b containing 2 occurrences of one of the chars, followed by its alternative. It will also accept baab as input and will not accept {e} as valid input.



2.1.3

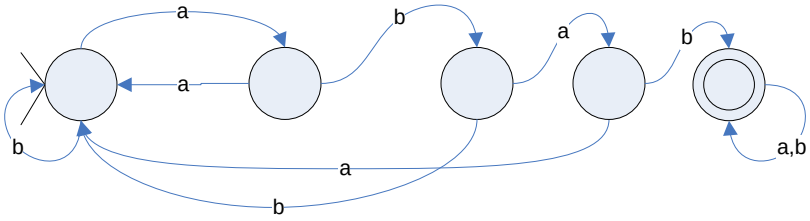
A

{w ∈ {a,b}*: each a in w is immediately preceded by a b}



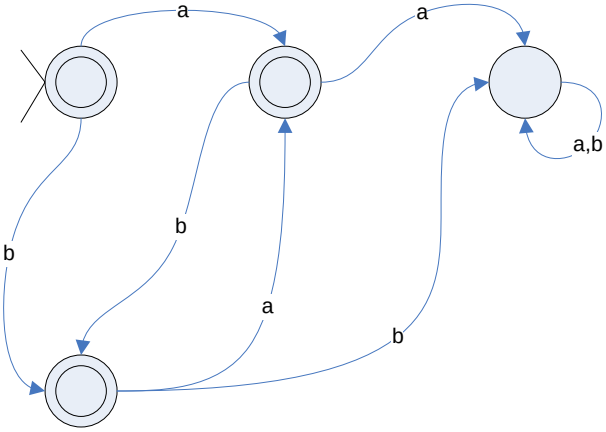
B

{w ∈ {a,b}*: w has abab as a substring }



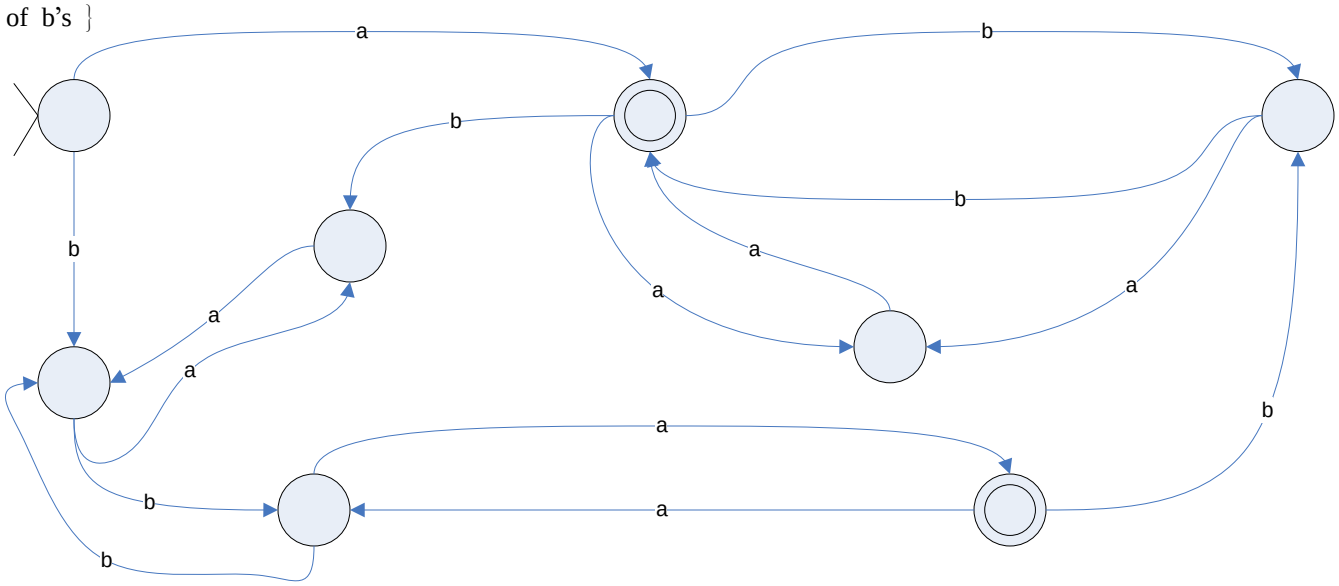
C

{w ∈ {a,b}*: w has neither aa nor bb as a substring }



D

{w ∈ {a,b}*: w has an odd number of a's and even number of b's }



E

{w ∈ {a,b}*: w has both ab and ba as substrings }