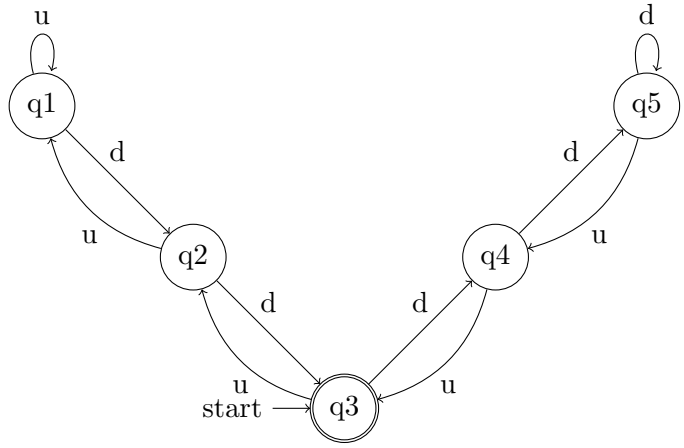
Homework #1

Kyle White

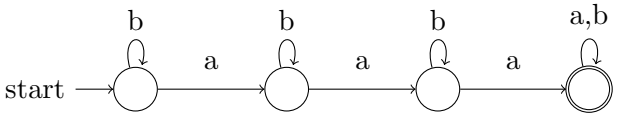
February 2, 2017



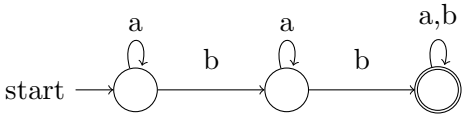
1.3)

1.4a)

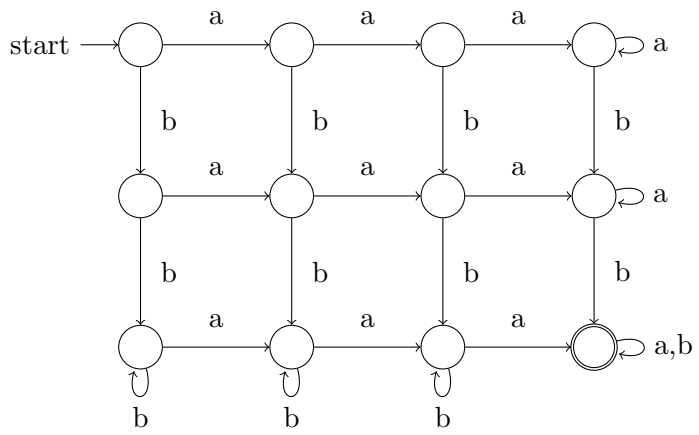
Accepts at least 3 a's



Accepts at least 2 b's

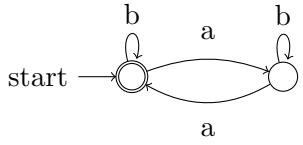


Accepts at least 3 a's and at least 2 b's

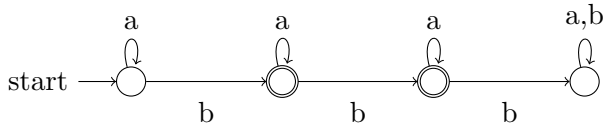


1.4c)

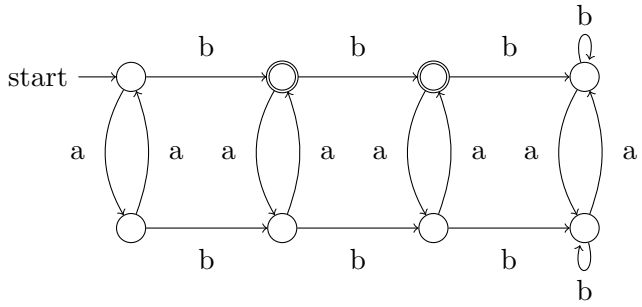
Accepts an even number of a's



Accepts one or two b's

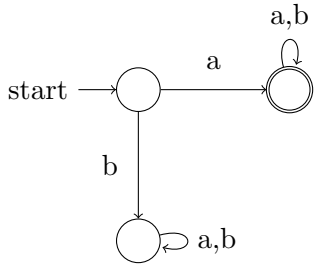


Accepts even number of a's and one or two b's

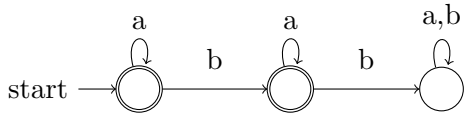


1.4e)

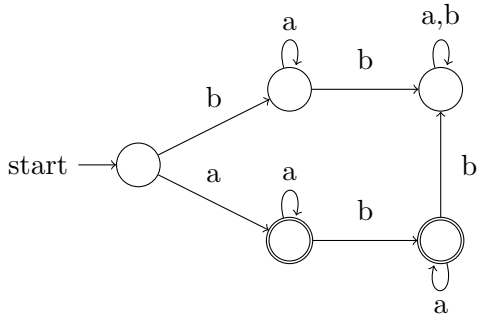
Starts with an a



Has at most one b

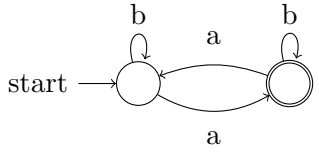


Starts with an a and has at most one b

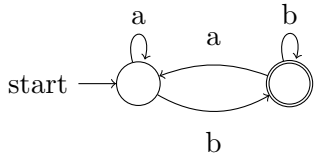


1.4f)

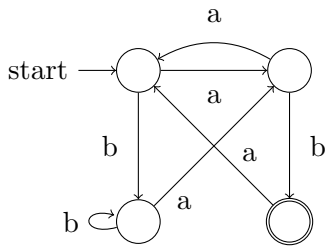
Has an odd number of a's



Ends with a b

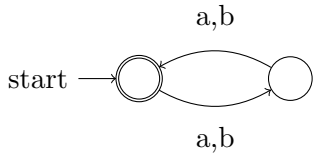


Has an odd number of a's and ends with a b

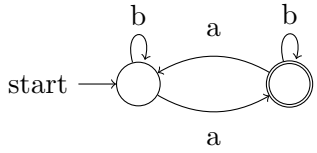


1.4g)

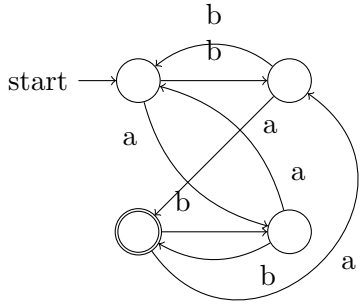
Has even length



Has an odd number of a's

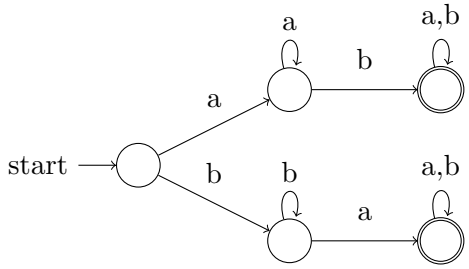


Has even length and an odd number of a's

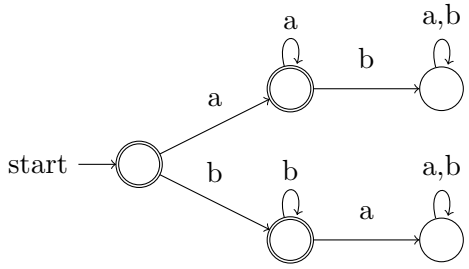


1.5c)

Contains the substring ab or ba

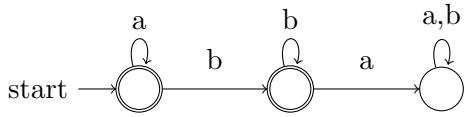


Does not contain the substring ab or ba

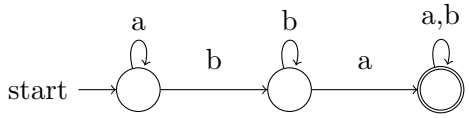


1.5d)

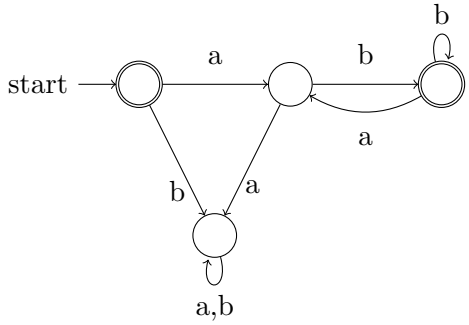
Any string in a*b*



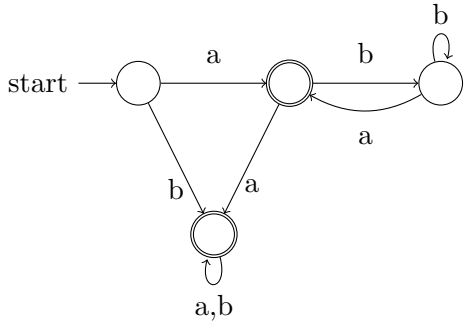
Any string not in a*b*



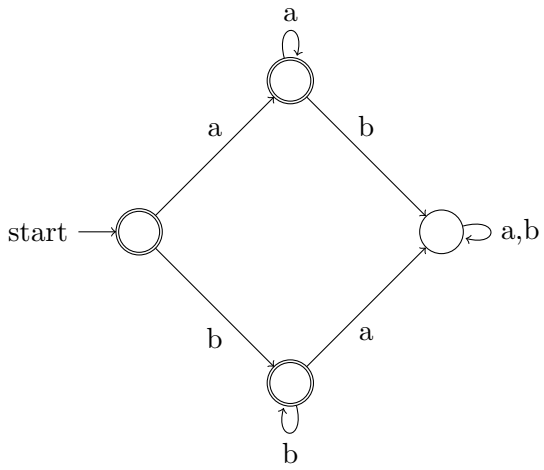
1.5e) Any string in (ab+)*



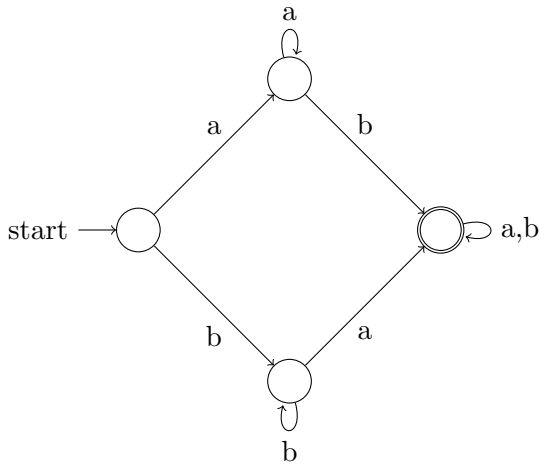
Any string not in (ab+)*



Any string in a*∪b*

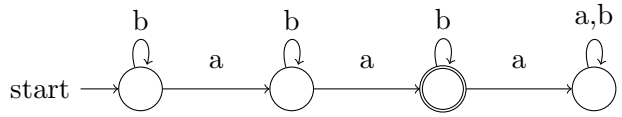


Any string not in a*∪b*

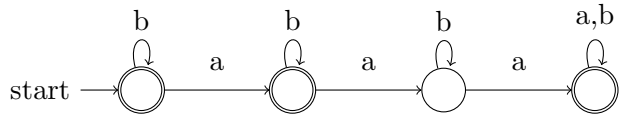


1.5g)

Accepts exactly two a's

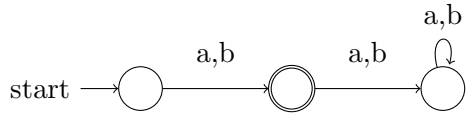


Accepts strings not containing exactly two a's

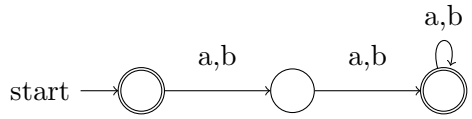


1.5h)

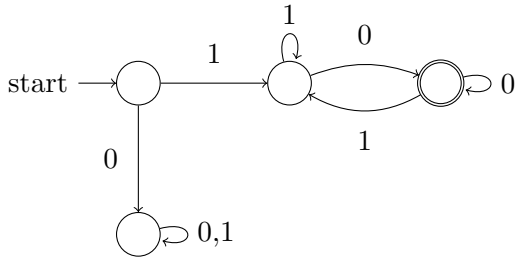
Any string except a and b



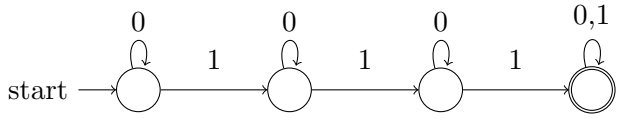
Any string that is a and b



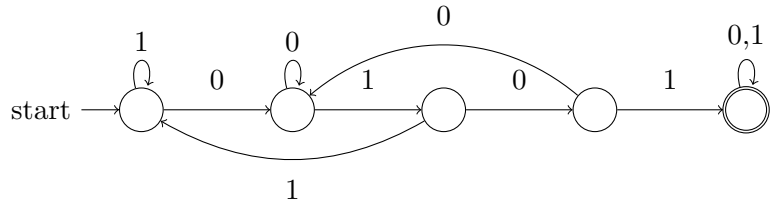
1.6a)



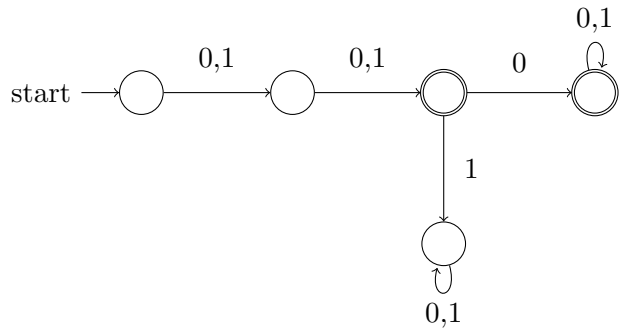
1.6b)



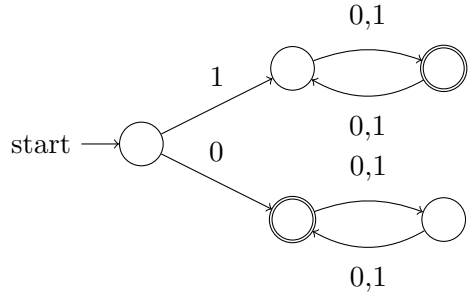
1.6c)



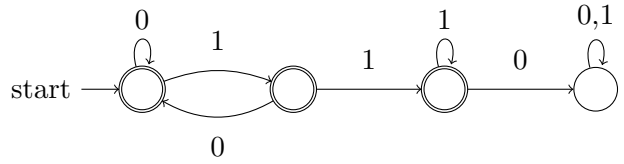
1.6d)



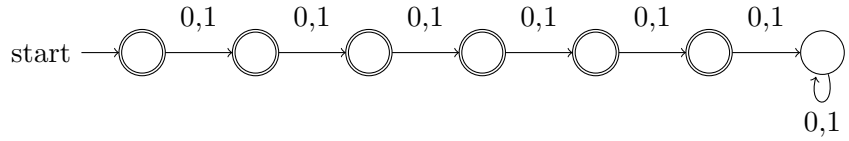
1.6e)



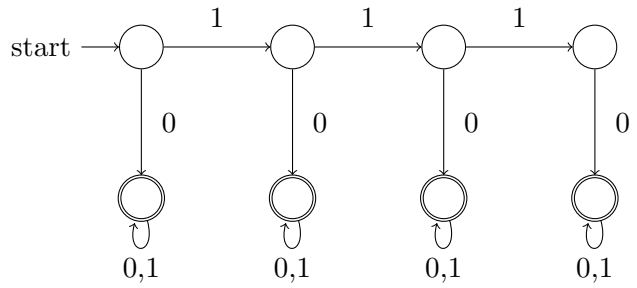
1.6f)



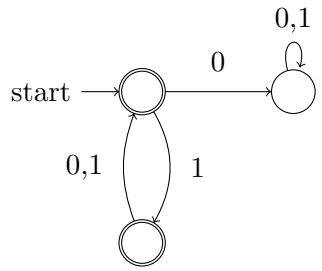
1.6g)



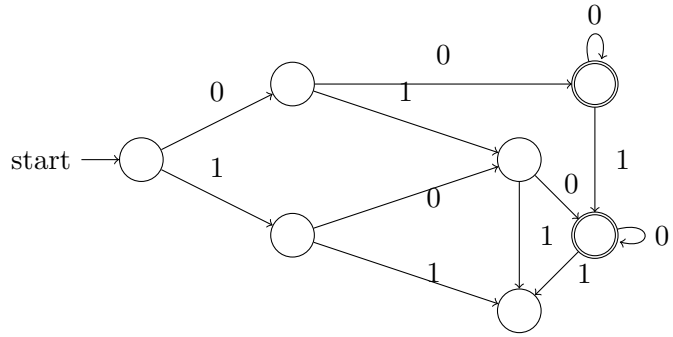
1.6h)



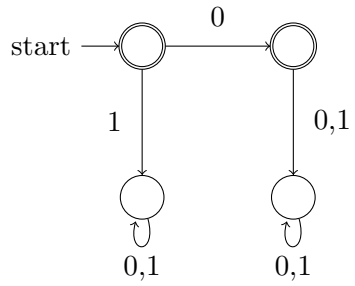
1.6i)



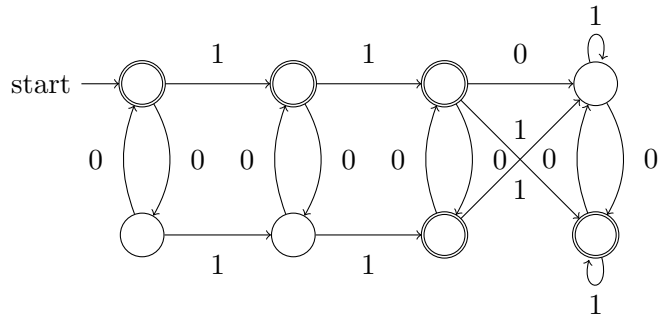
1.6j)



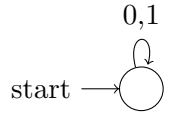
1.6k)



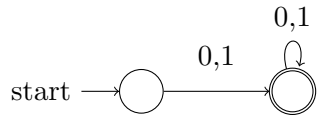
1.6l)



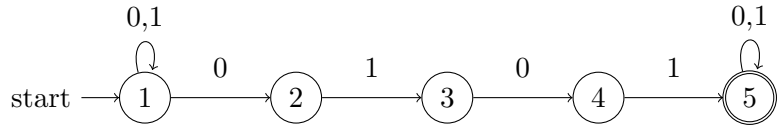
1.6m)



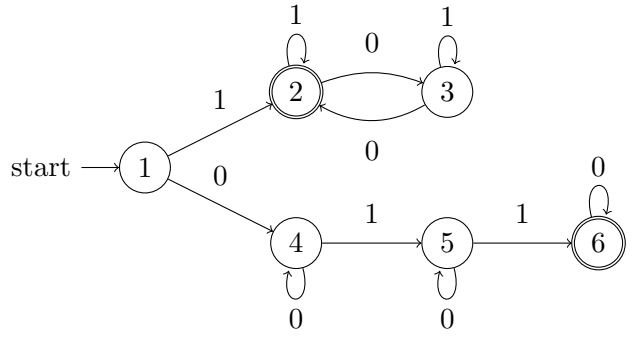
1.6n)



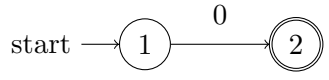
1.7b)



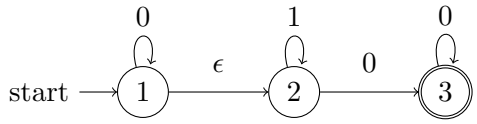
1.7c)



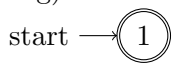
1.7d)



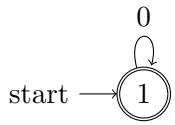
1.7e)



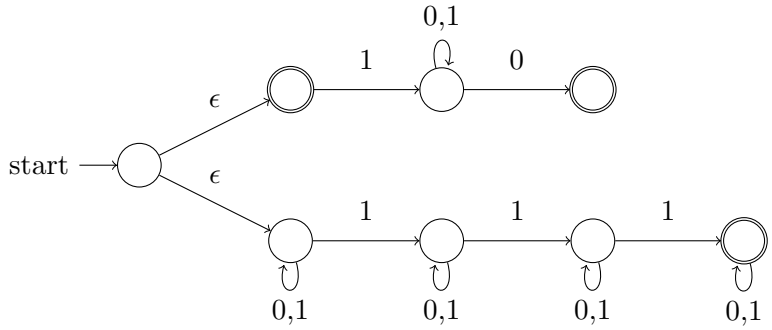
1.7g)



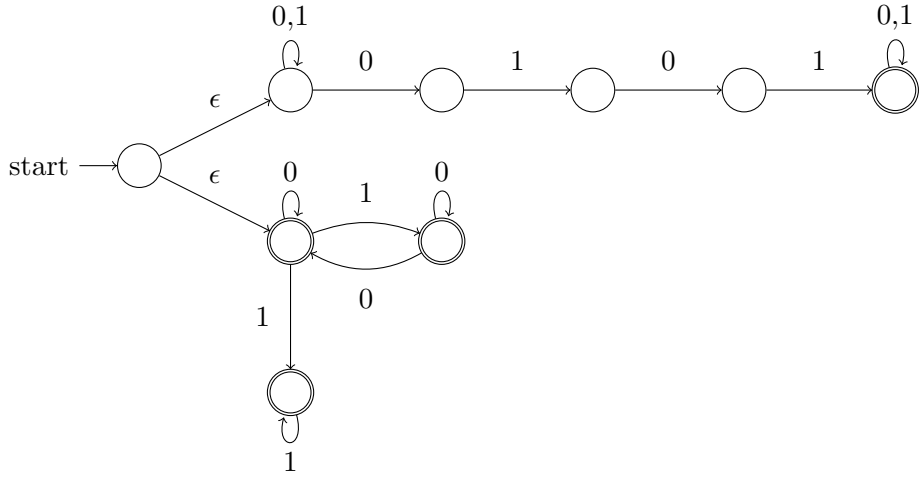
1.7h)



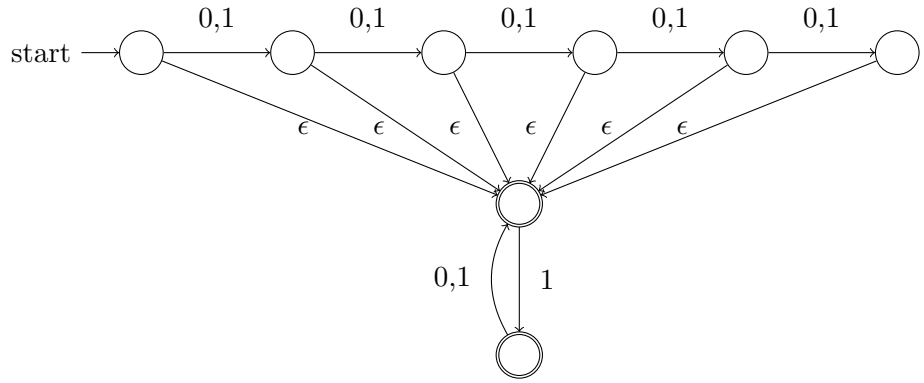
1.8a)



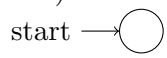
1.8b)



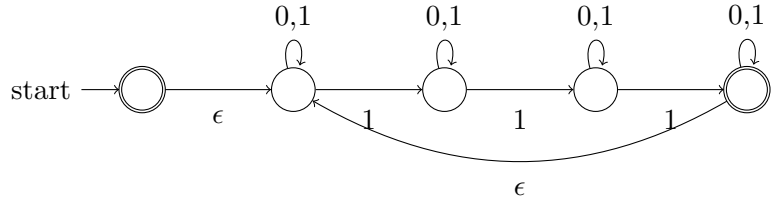
1.9a)



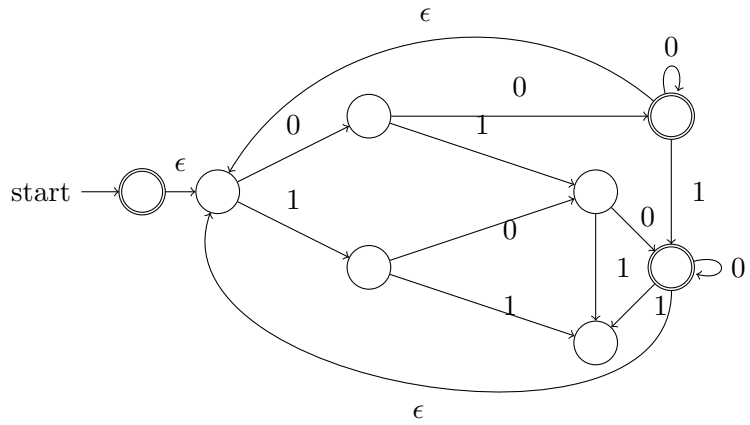
1.9b)



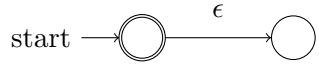
1.10a)



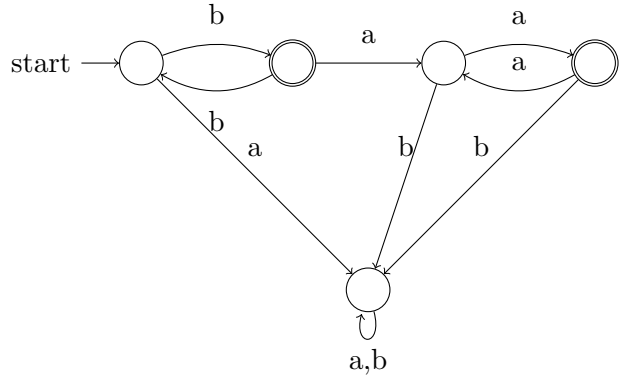
1.10b)



1.10c)

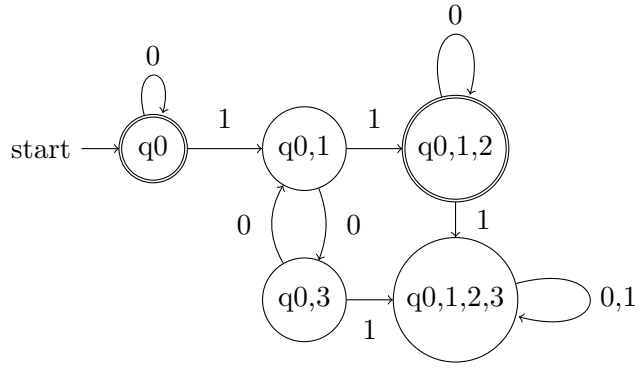


1.12)

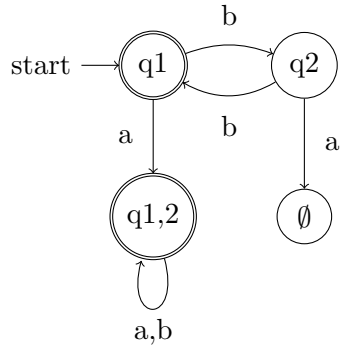


R = b(bb)*(aa)*

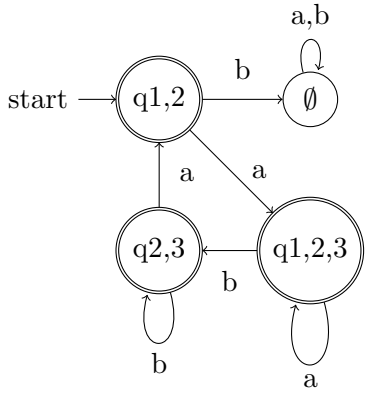
1.13)



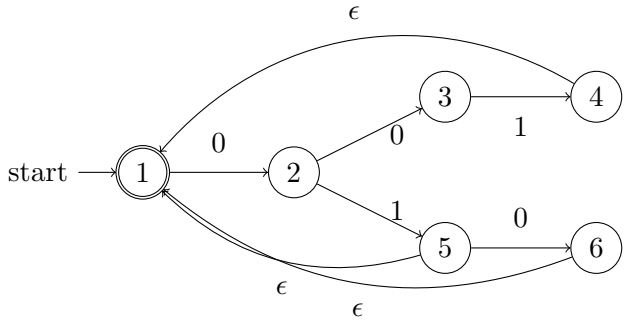
1.16a)



1.16b)



1.17a)



1.18)
a) $1\Sigma^*0$
b) $\Sigma^*1\Sigma^*1\Sigma^*1\Sigma^*$
c) $\Sigma^*0101\Sigma^*$
d) $\Sigma\Sigma0\Sigma^*$
e) $(0 \cup 1\Sigma)(\Sigma\Sigma)^*$
f) $0^*(10^+)^*1^*$
g) $(\in \cup\Sigma)^5$
h) $\in \cup\Sigma \cup 0\Sigma \cup 10 \cup 0\Sigma\Sigma \cup 10\Sigma \cup 110\Sigma^3\Sigma^+$
i) $(1\Sigma)^*(\in \cup 1)$
j) $00^+ \cup 100^+ \cup 0^+ \cup 0^+10^+ \cup 00^+1$
k) $0 \cup \in$
l) $1^*(01^*01^*) \cup 0^*10^*10^*$
m) $\emptyset$
n) Σ^+

1.20)
a) Members: ab, abb

Non-Members: ba, bba

b) Members: abab, ababab
Non-Members: aba, bab

c) Members: aaaaa, bbb
Non-Members: baab, bbaa

d) Members: aaa, aaaaaaaaa
Non-Members: a, aa

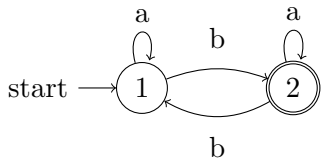
e) Members: aba, aabbaa
Non-Members: ab, a

f) Members: aba, bab
Non-Members: ab, ba

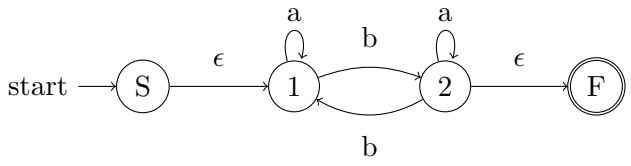
g) Members: ab, b
Non-Members: ba, b

h) Members: a, ba
Non-Members: b, ab

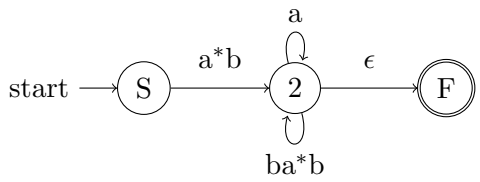
1.21)



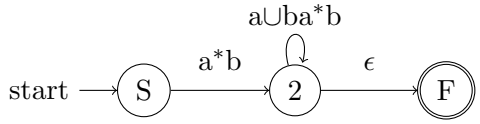
Step 1:



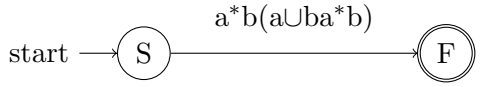
Step 2:



Step 3:

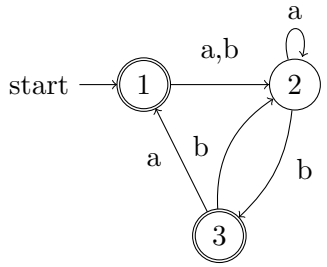


Step 4:

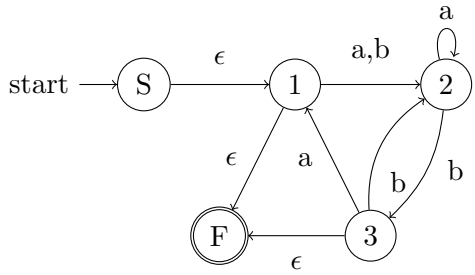


Regular Expression: a*b(a∪ba*b)

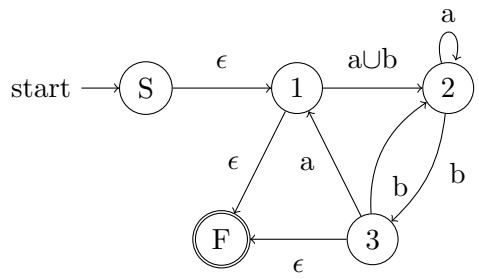
1.21b)



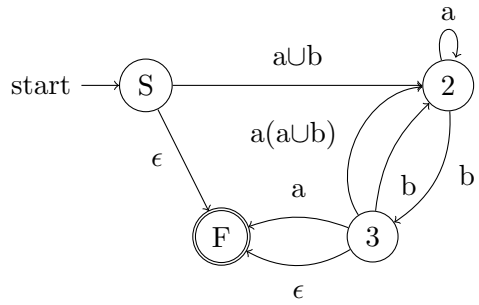
Step 1:



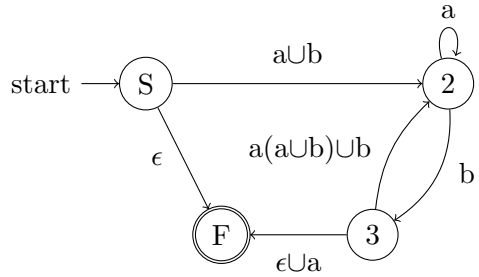
Step 2:



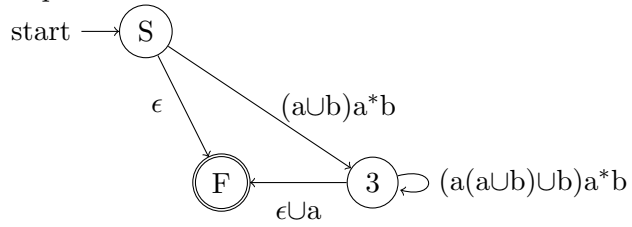
Step 3:



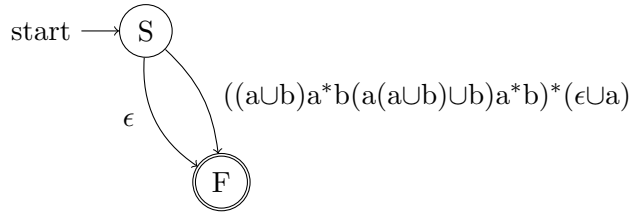
Step 4:



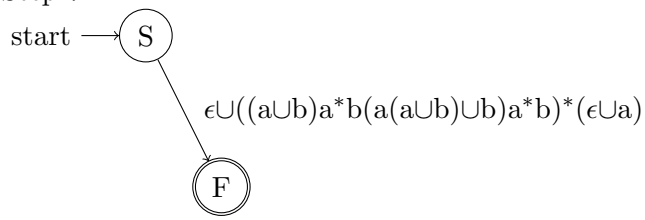
Step 5:



Step 6:

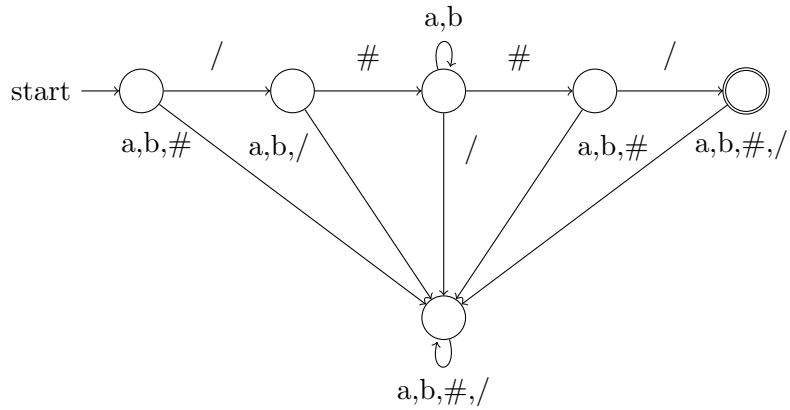


Step 7:



Regular Expression = ϵ∪((a∪b)a*b(a(a∪b)∪b)a*b)*(ϵ∪a)

1.22a):



1.22b) Regular Expression = /#(a∪b)*#/