Q1 a) /\b(\w+)\s+\1\b/

b) /(b ab | ba)*/

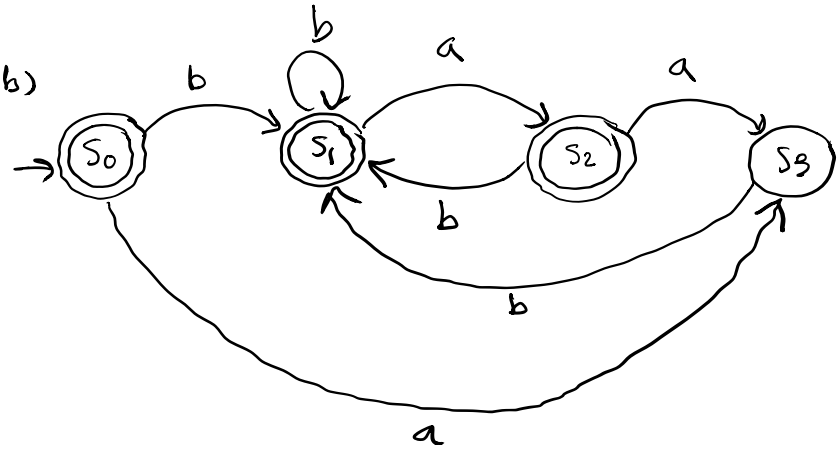
c) /(0[1-9] | 1[0-2])\/(0[1-9] | [12][0-9] | 3[01])\/[0-9]{4}/

d) /^[0-9]+\b.*\b\w+$/

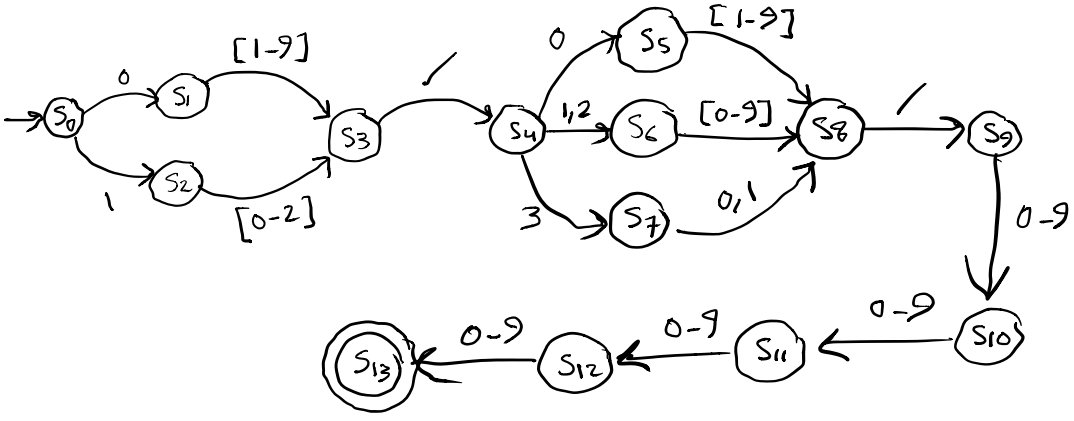
e) /(walk | talk | break)(s|ing)? | (walk|talk)ed | broke | broken/

Q2

b)




c)

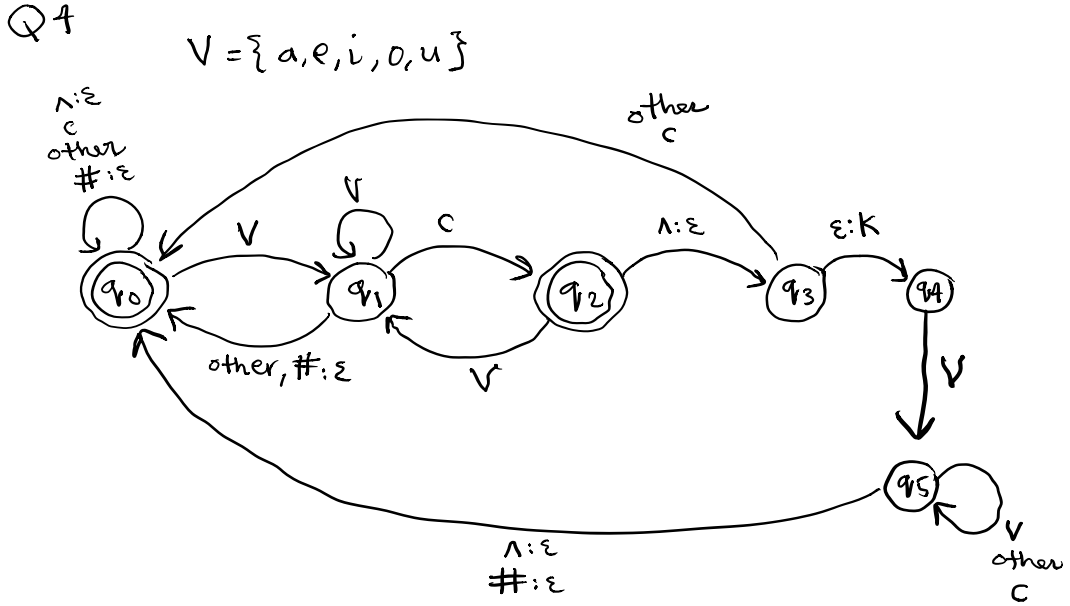



Q3

/(ab | aba)+/

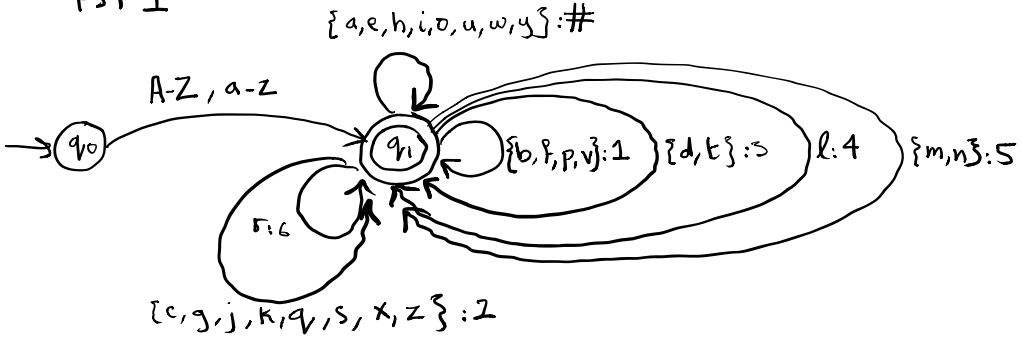
/(1* (01*0)*)*/

Q4

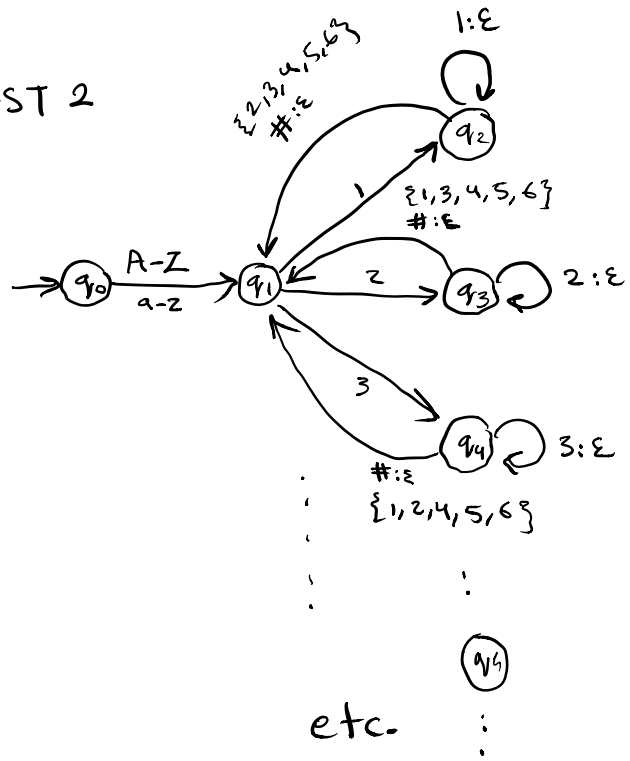

V = {a, e, i, o, u}
λ:ε
c
other
#:ε
other
c
V
V
C
λ:ε
ε:K
q0
q1
q2
q3
q4
q5
other, #:ε
V
V
λ:ε
#:ε
V
other
C

Q5

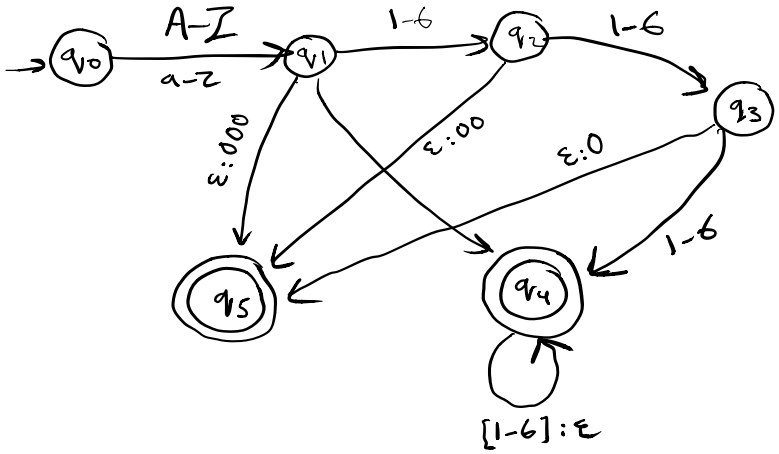
FST 1


{a,e,h,i,o,u,w,y}:#
A-Z, a-z
q0
q1
{b,f,p,v}:1
{d,t}:3
l:4
{m,n}:5
r:6
{c,g,j,k,q,s,x,z}:2

FST 2


1:ε
{2,3,4,5,6}
#:ε
q0
A-Z
a-z
q1
1
{1,3,4,5,6}
#:ε
q2
2
q3
2:ε
3
q4
3:ε
#:ε
{1,2,4,5,6}
q5
etc.

$FST_3$


A-I
a-z
q0
q1
1-6
q2
1-6
q3
ε:000
ε:00
ε:0
1-6
q5
q4
[1-6]:ε