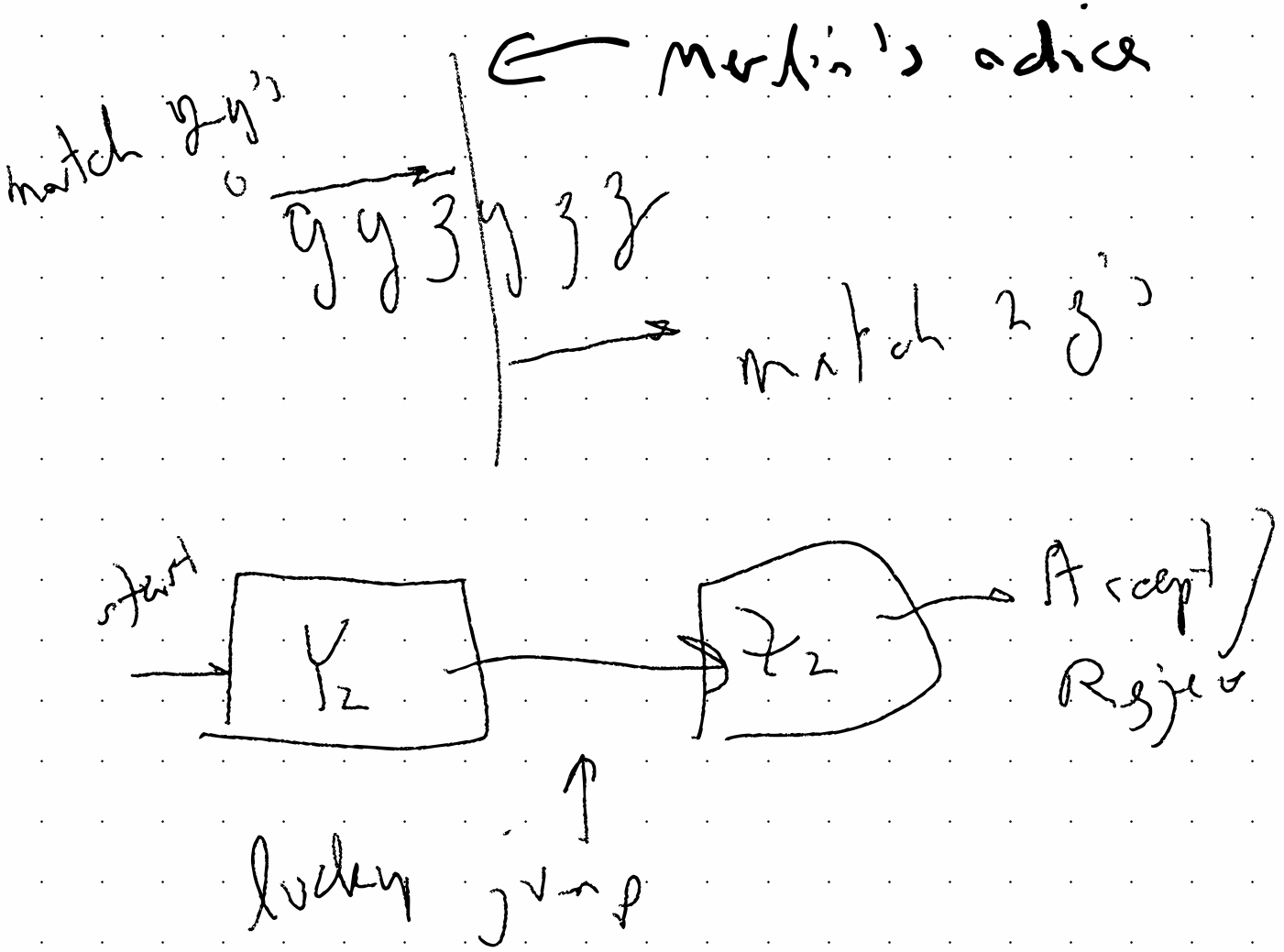
# Regular Expressions

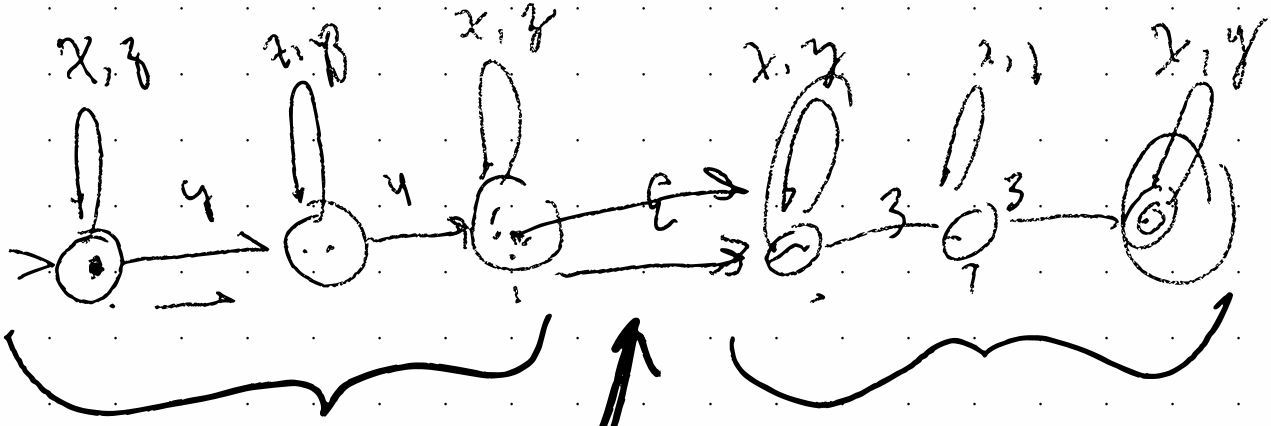
## concatenation

$$L = Y_2 \circ Z_2$$

$Y_2 = \{ w \mid w \text{ has exactly 2 } y\text{'s} \}$

$Z_2 = \{ w \mid w \text{ has exactly 2 } z\text{'s} \}$


Merlin's advice
match yy'
yy3y3z
match zz'
start
Y2
Z2
Accept
Reject
lucky guess




Epsilon move

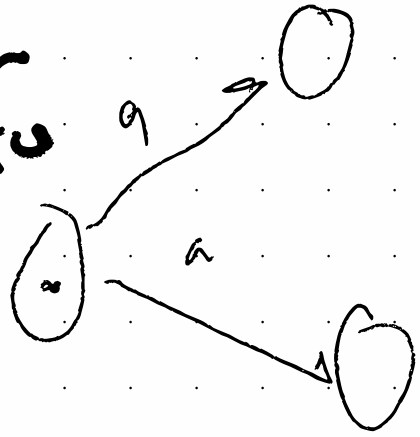
yy3|43y

yy4(33)

ε

← insert "ε" character

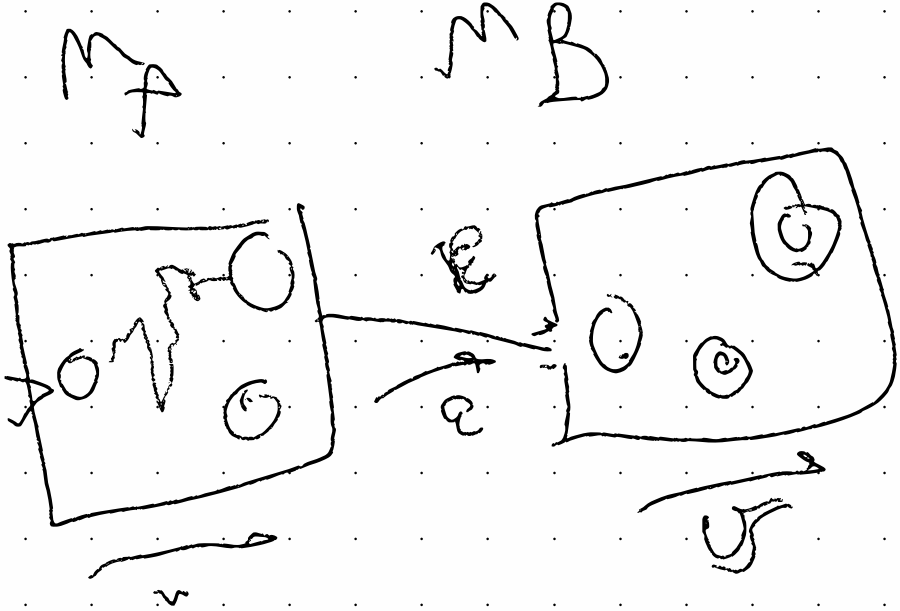
transition function can give a choice of states to go to..




set of states also the empty set

$$\delta : Q \times \Sigma_\varepsilon \longrightarrow P_{WR}(Q)$$

$$\Sigma_\varepsilon = \Sigma \cup \{\varepsilon\}$$




$M_1, M_B \quad \xi = u \mid v$

Concatenate, general construction

accept

there is at least one computation that ends in an accept state

not accept

no computation leading to an accept state