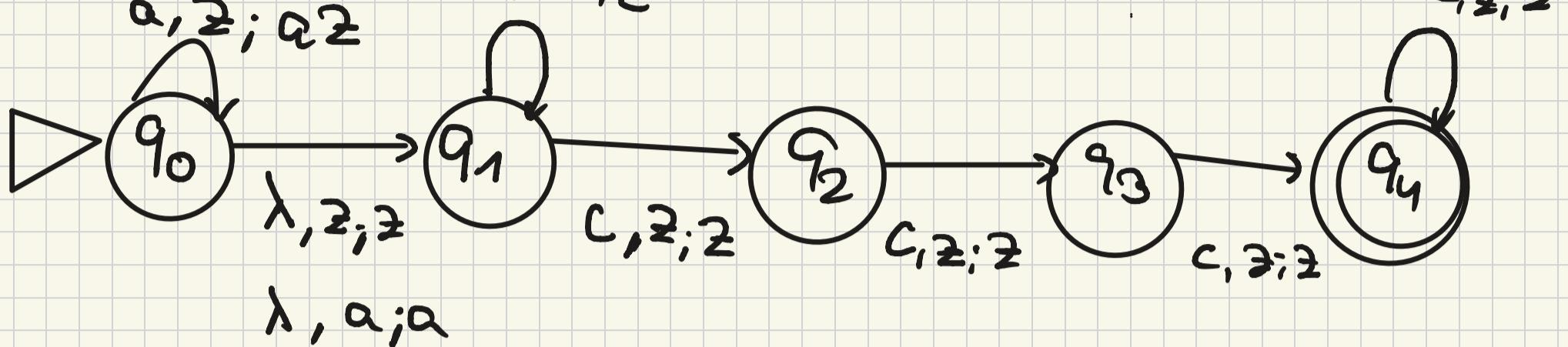




1

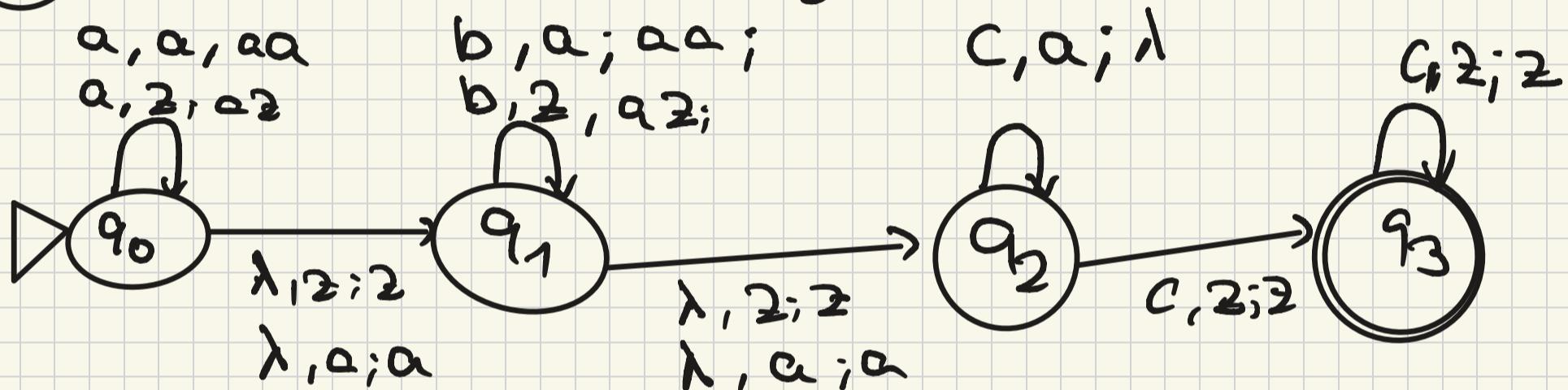
 $a, x; y$

$$\mathcal{L} = \{ a^i b^j c^k \mid i, j, k \geq 3 \}$$

 $\begin{matrix} a, a; aa \\ a, z; az \end{matrix}$
 $b, q; \epsilon$


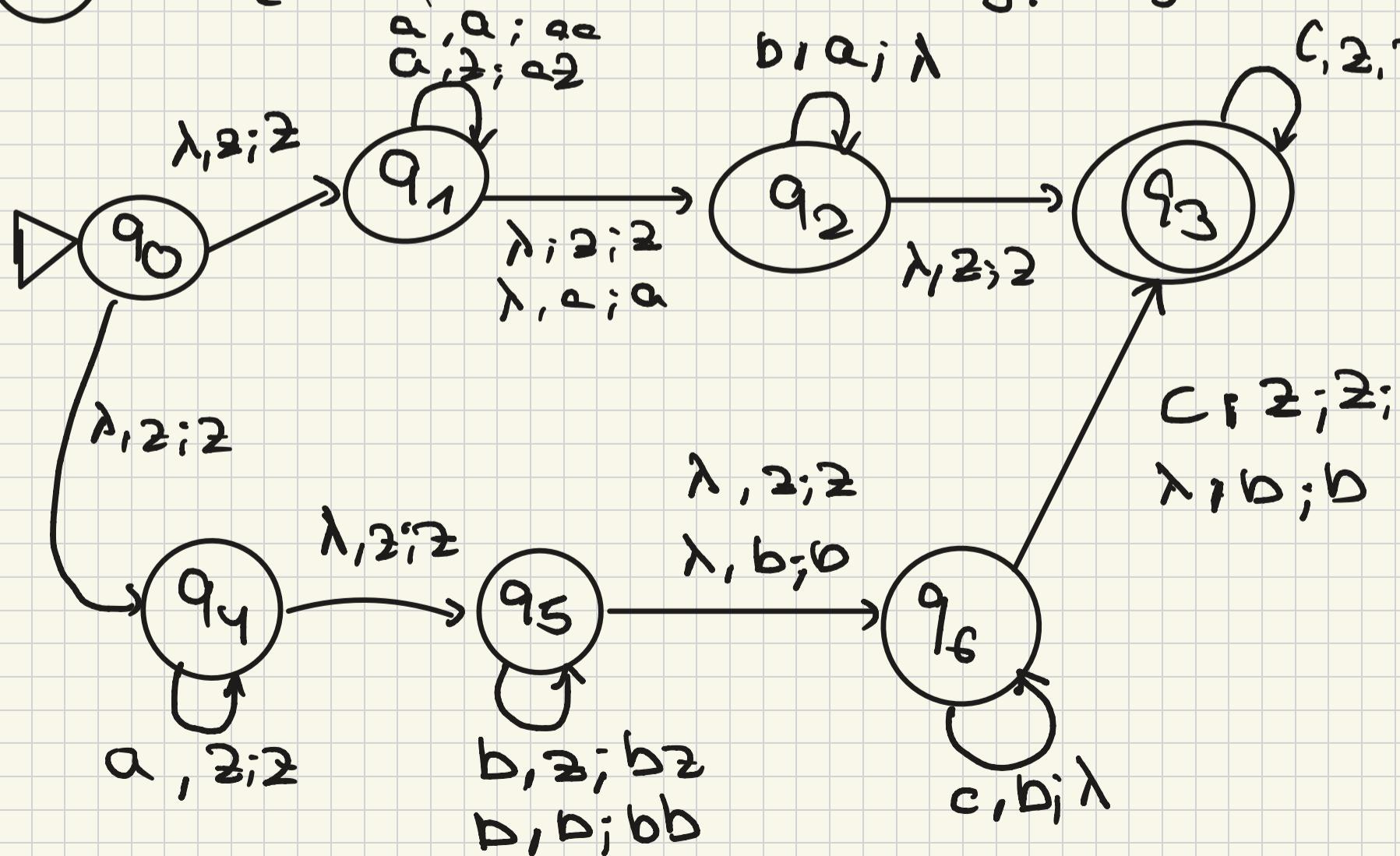
2

$$\mathcal{L} = \{ a^i b^j c^k \mid i > j + k \}$$

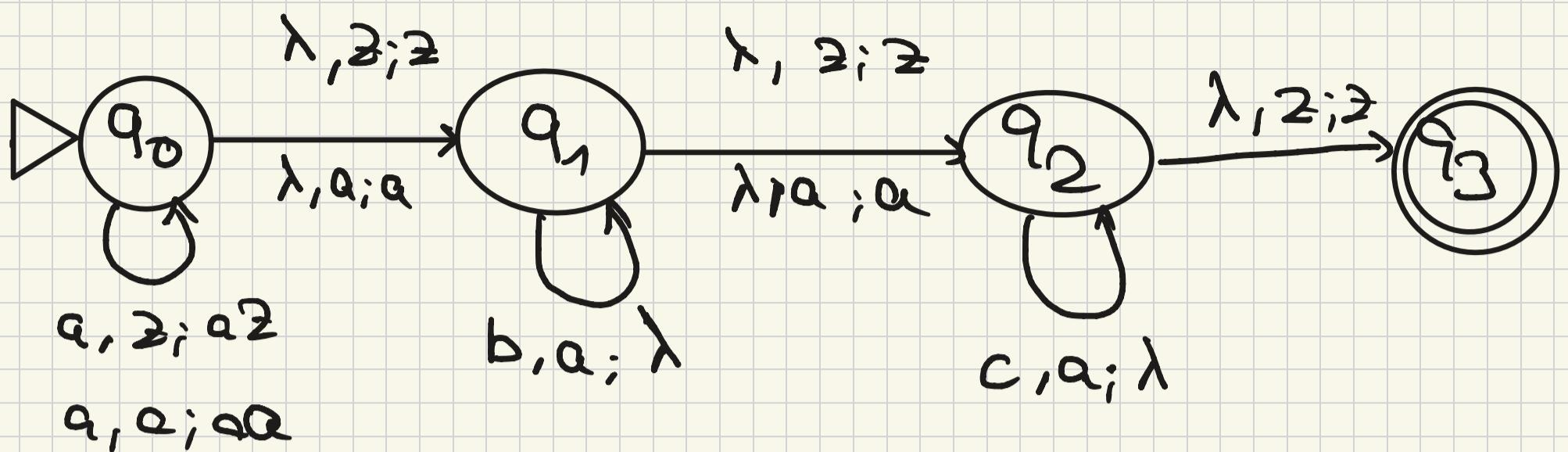
 $\begin{matrix} a, a, aa \\ a, z, az \end{matrix}$
 $\begin{matrix} b, a; aa \\ b, z; az \end{matrix}$
 $c, a; \lambda$


3

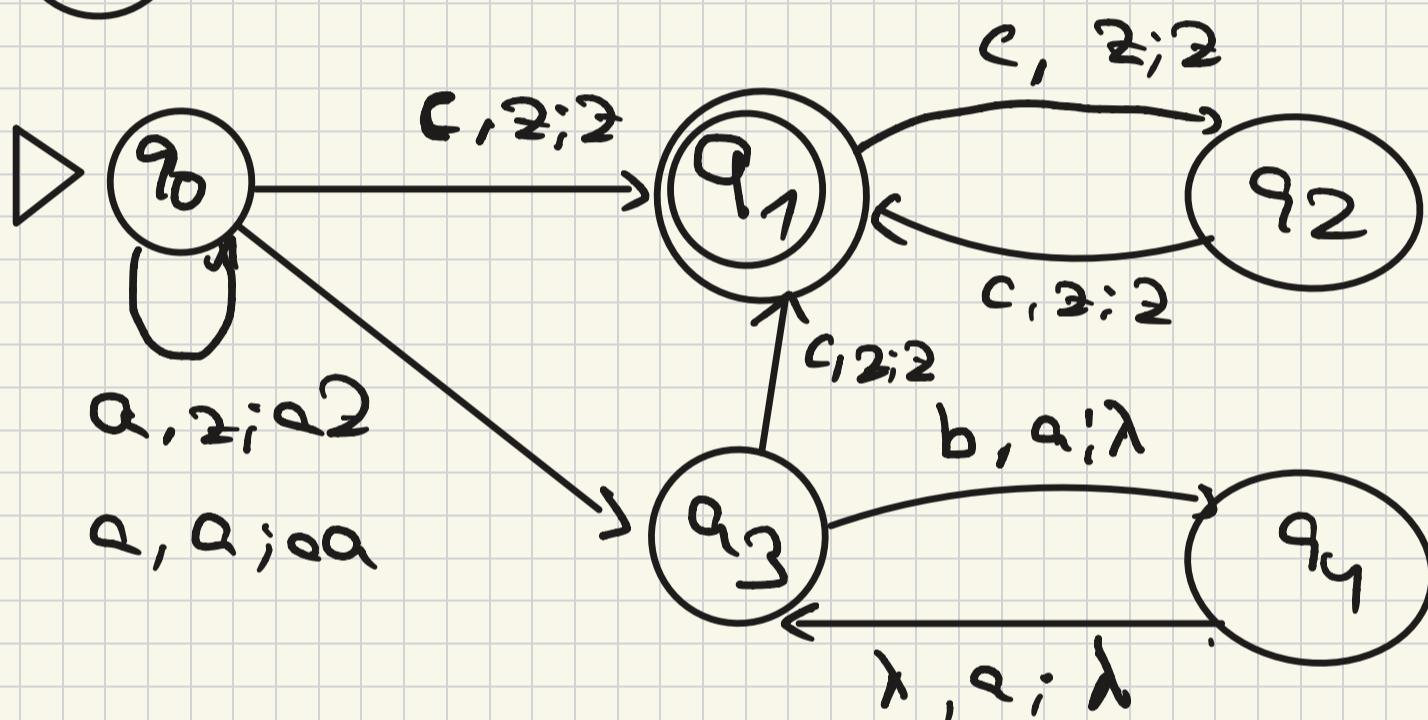
$$\mathcal{L} = \{ a^i b^j c^k \mid i = j \text{ or } j \neq k \}$$

 $\begin{matrix} a, a; aa \\ a, z; az \end{matrix}$
 $b, q; \lambda$
 $c, z; z$


4) $L = \{ a^i b^j c^k \mid k = i - j ; i, j, k \geq 0 \}$

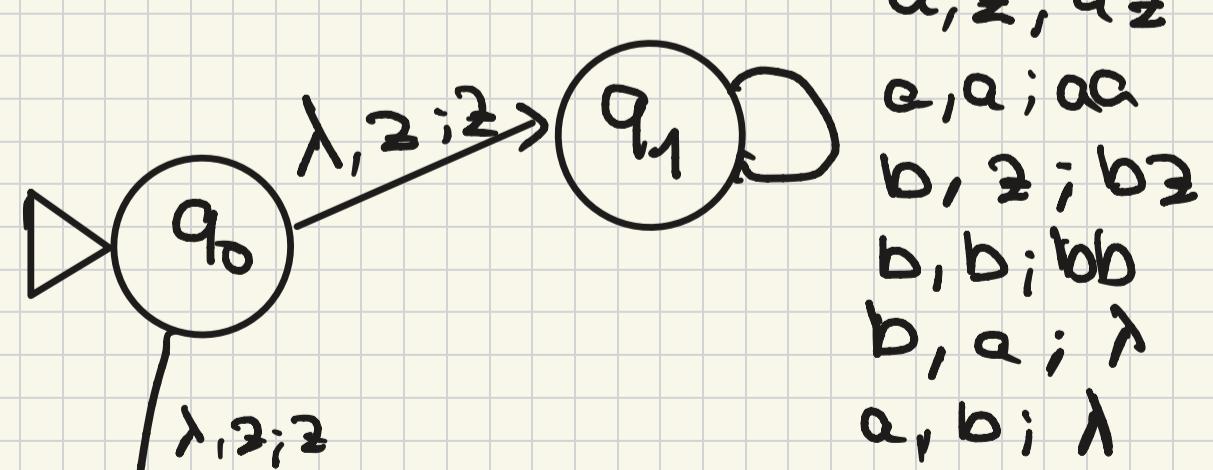


5) $L = \{ a^i b^j c^k \mid N(a) = 2N(b) \text{ and } N(c) \text{ is imp} \}$



6) a) $N(c) = N(a) - N(b)$

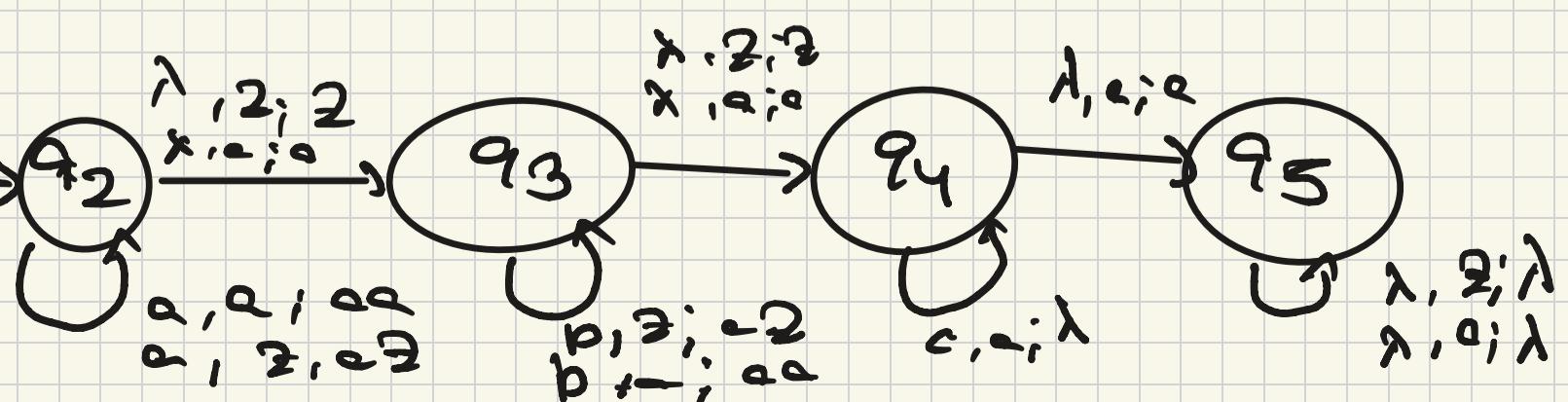
b) $a^i b^j c^k \mid k - i < j$



$a, 2; a2$
 $c, a; \lambda$
 $a, a; aa$
 $b, 2; b2$
 $b, b; bb$
 $b, a; \lambda$
 $a, b; \lambda$

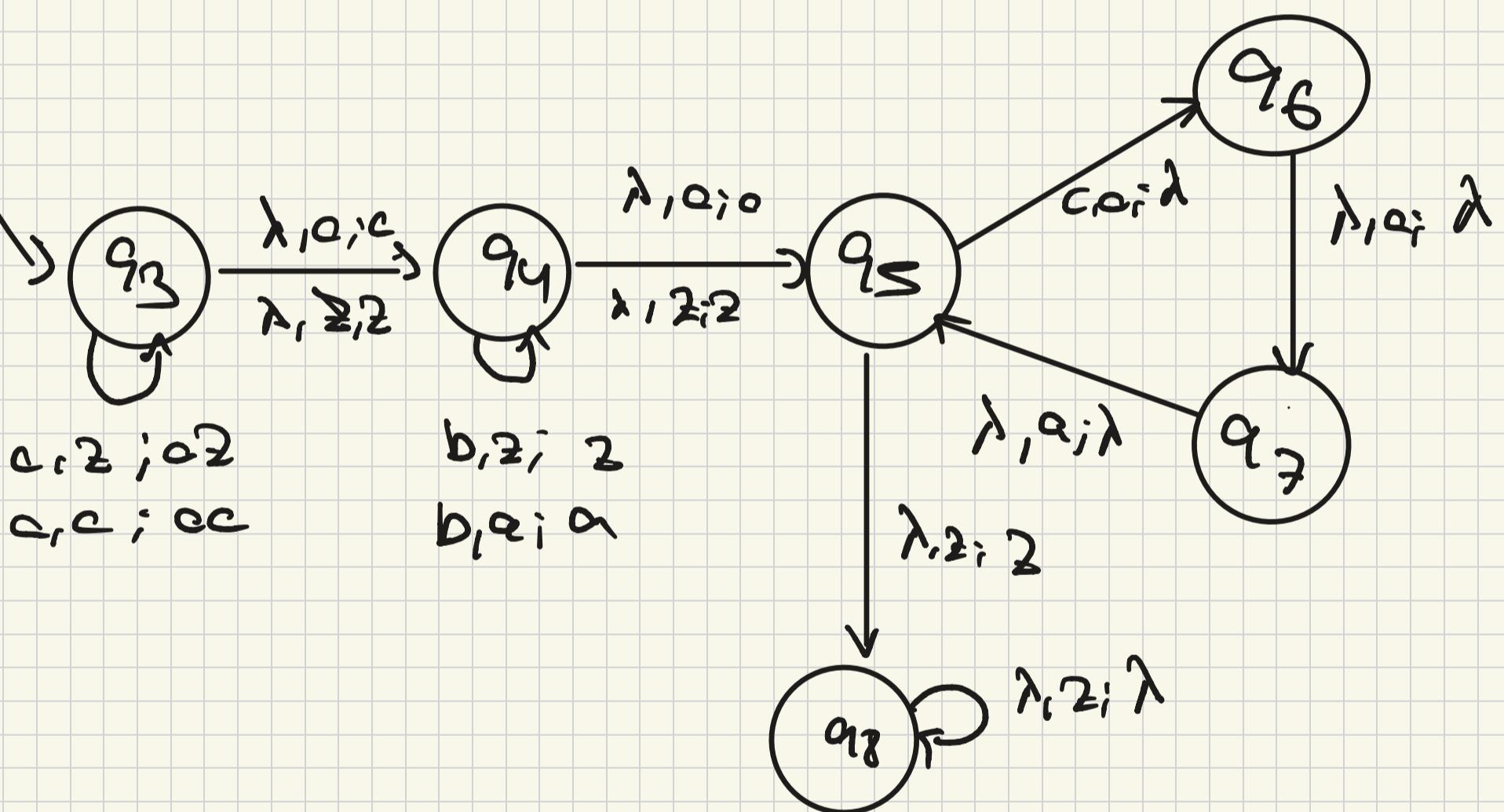
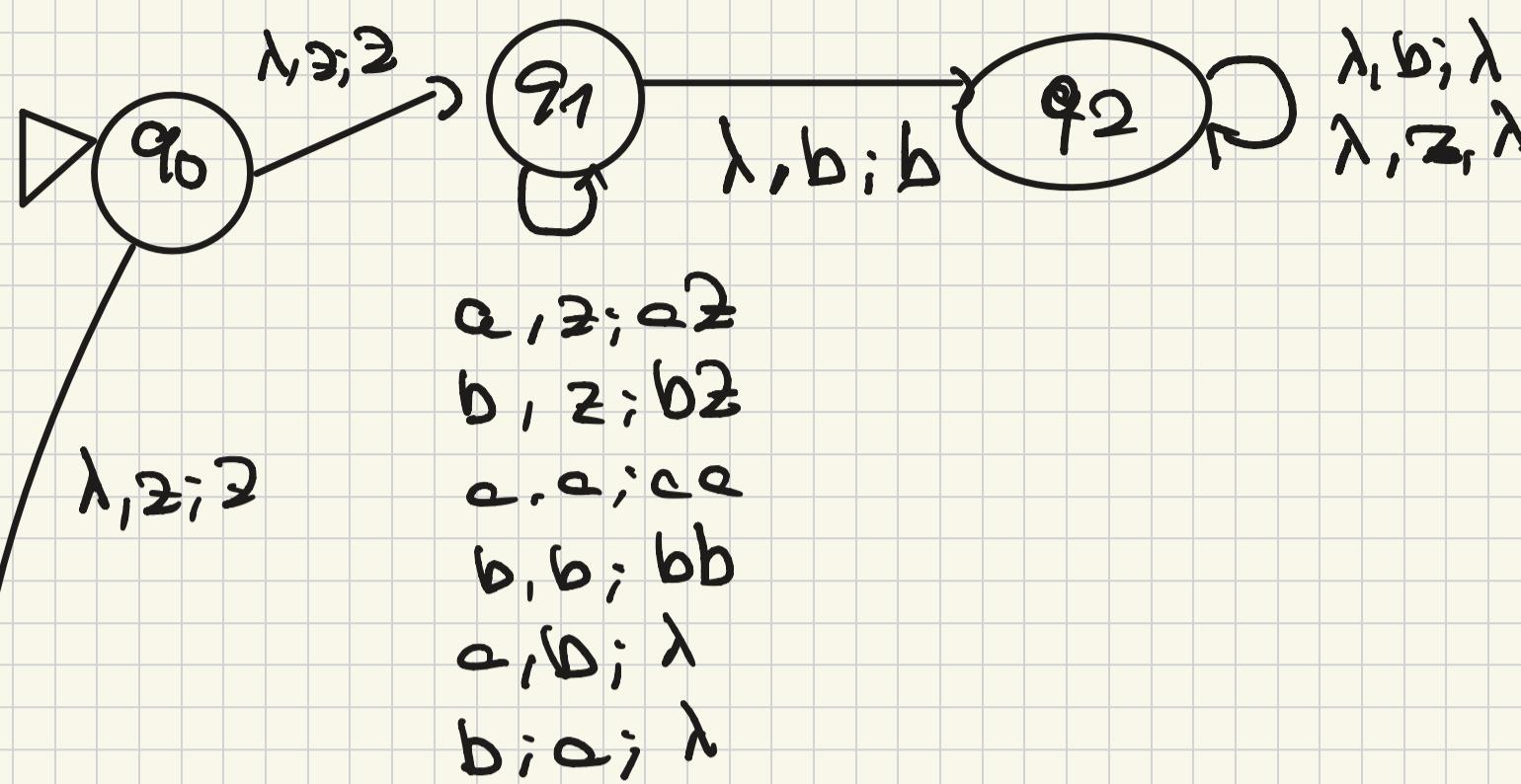
$c, a; \lambda$
 $c, b; bb$
 $c, 2; b2$
 $\lambda, 2; \lambda$

$N(c) = N(b) + N(a)$



$\mathcal{F} = c) N(a) < N(b)$

d) $a^i b^j c^k \mid \beta K = i$



8) e) $a^i b^j c^k d^m | i+k=j+m$ f) $a^i b^j c^k d^m | i+m=j+k$

