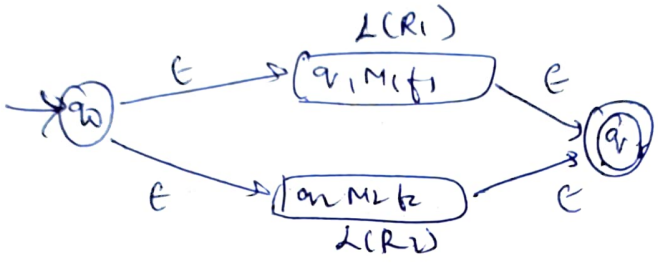
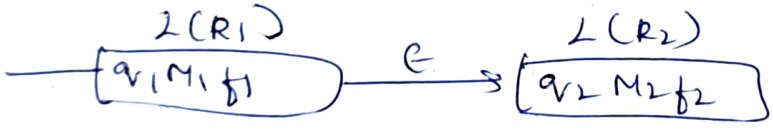
# Obtain ε-NFA from Regular Expression

Let R be a regular expression. Then there exists a finite automaton $M = (Q, \Sigma, \delta, q_0, F)$ which accepts $L(R)$.

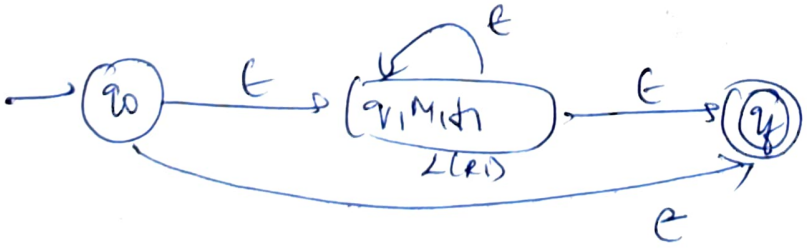
Case 1: $R = R_1 + R_2$. We can construct an NFA which accepts either $L(R_1)$ or $L(R_2)$ which can be represented as $L(R_1 + R_2)$ :-




Case 2: $R = R_1 . R_2$. We can construct an NFA which accepts $L(R_1)$ followed by $L(R_2)$ which can be represented as $L(R_1 . R_2)$

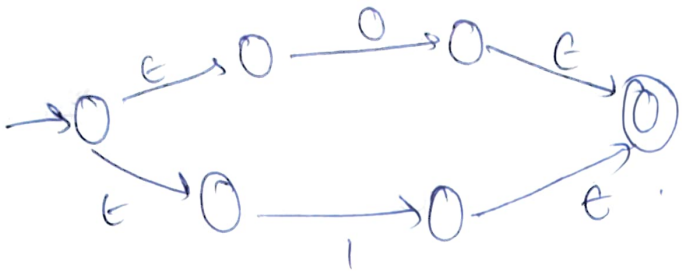



Case 3: $R = (R_1)^*$. We can construct an NFA which accepts either $L(R_1)^*$ as shown:

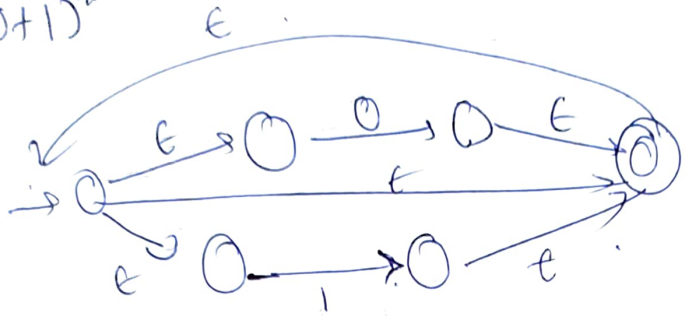


# Problems

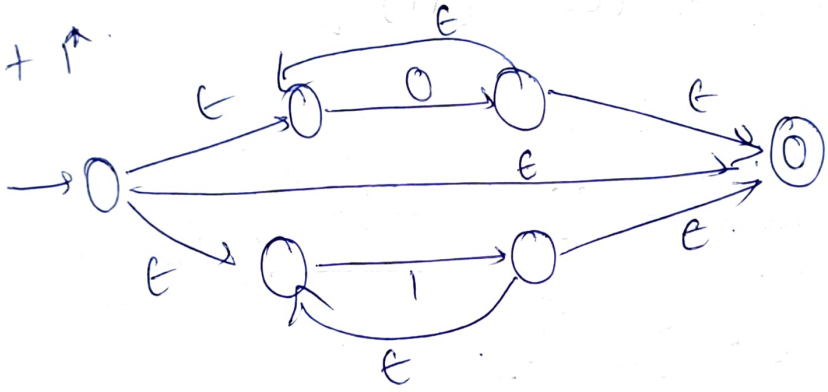
1. $(0+1)$



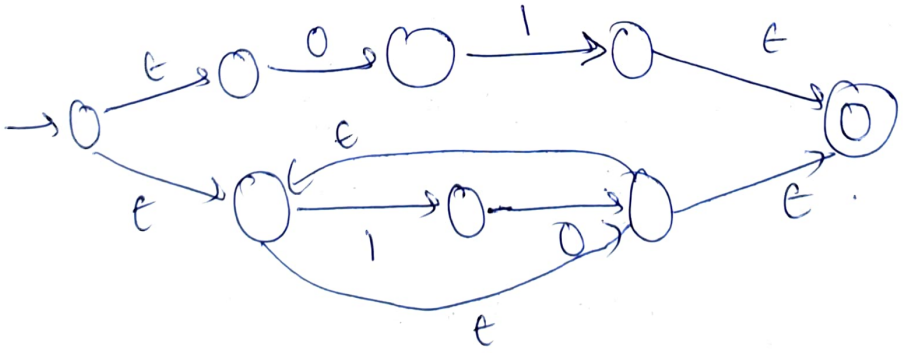

2. $(0+1)^*$



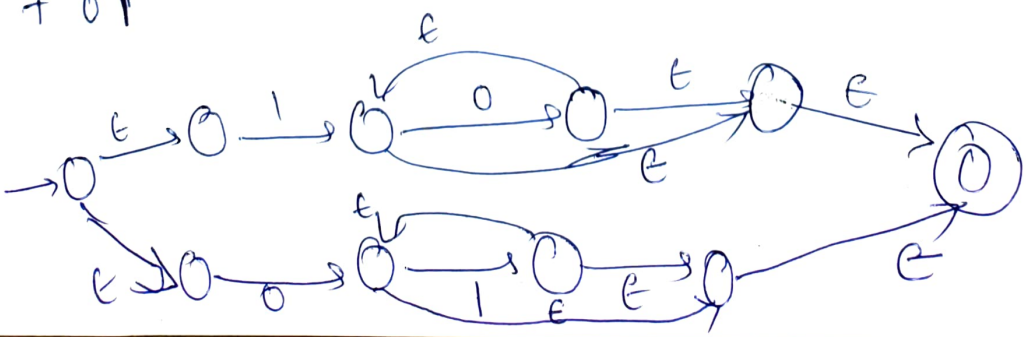

3. $0^* + 1^*$



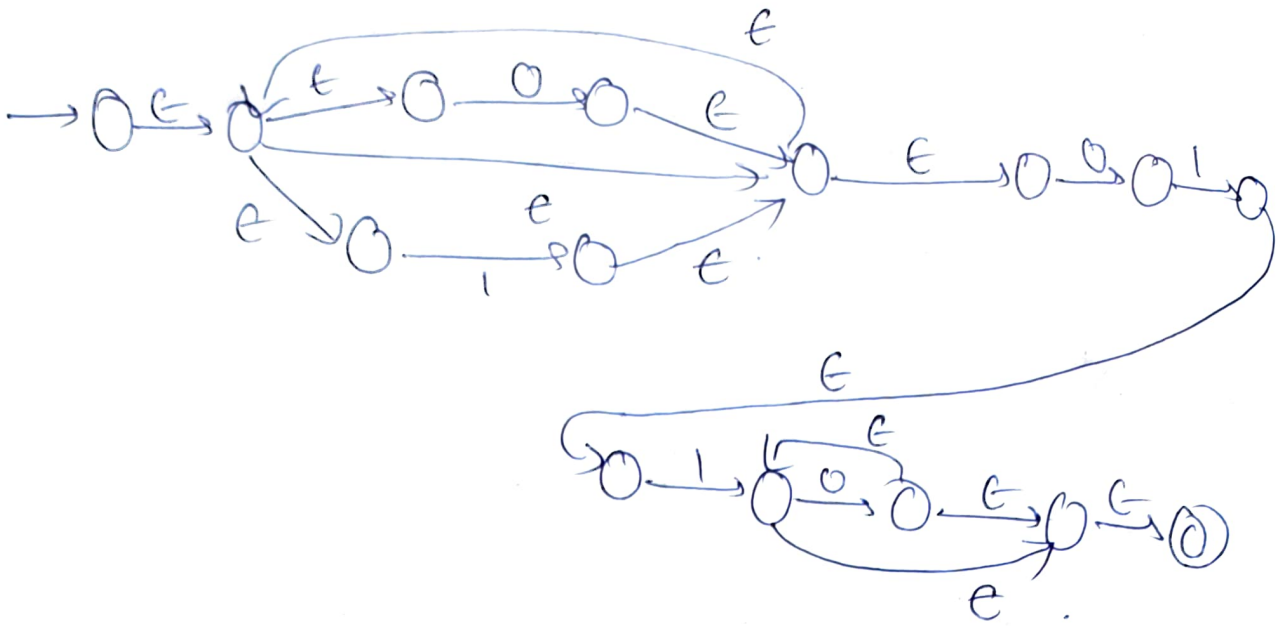

4. $01 + (10)^*$



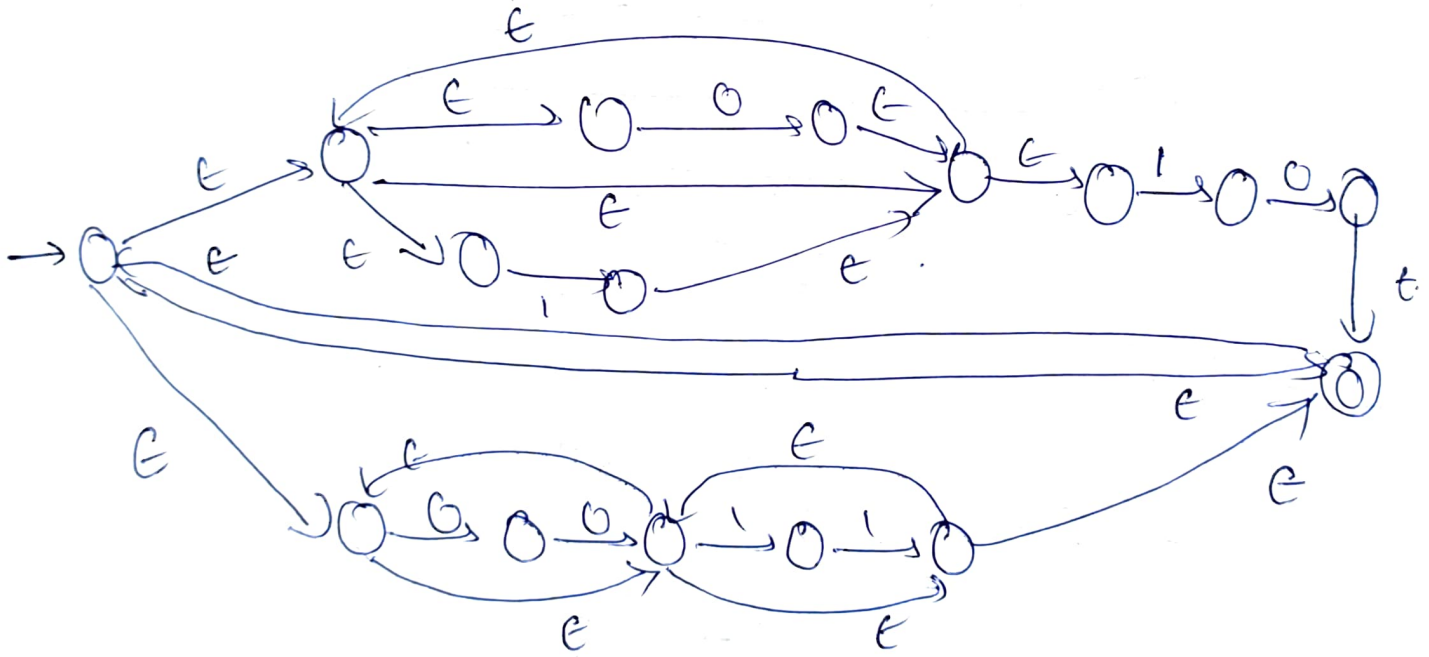

5. $1^* + 0^*$



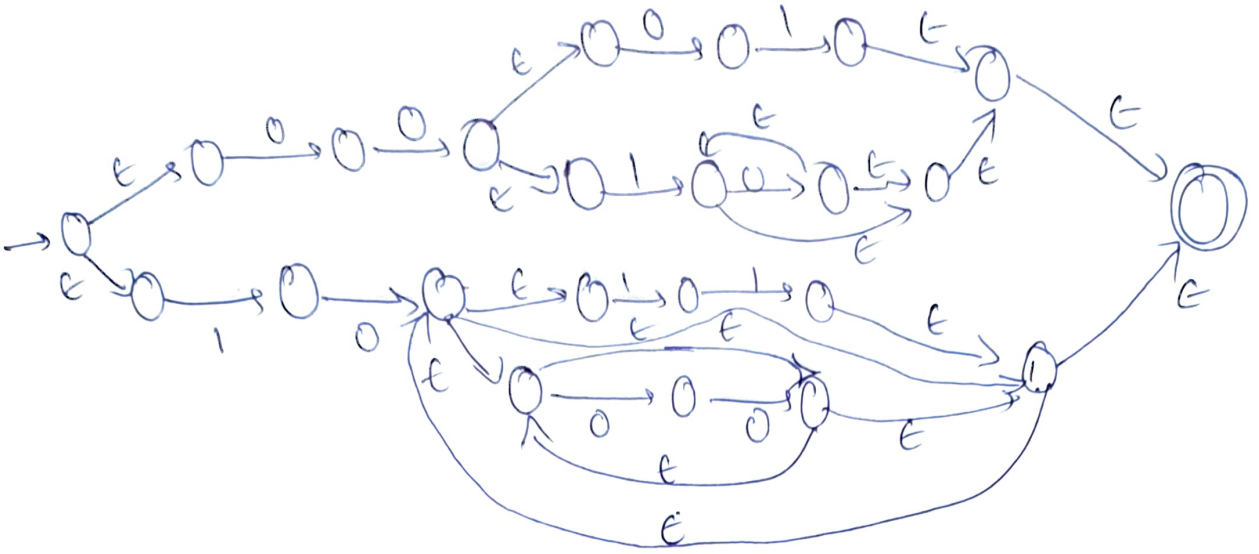
6. $(0+1)^* . 01 (10^*)$



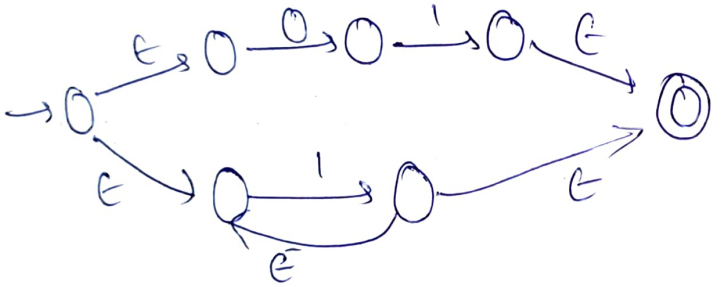

7. $((0+1)^* . 10 + (00)^* (11)^*)^*$




8. $00(01+10^*) + 10(11+(00)^*)^*$



9. $01+1^*$



10. $((01^* + 1)^* \cdot (10+11))$

11. $10(11+10^*) + 11(11^* + 01)^*$

12. $(0(0)^*0 + 11^*)^*$

13. $(01+10)^*$

14. $01^* + 1^*$

15. $ab(a+b)^*$

16. $a^* + b^* + c^*$

A. $(a+b)^* a a (a+b)^*$