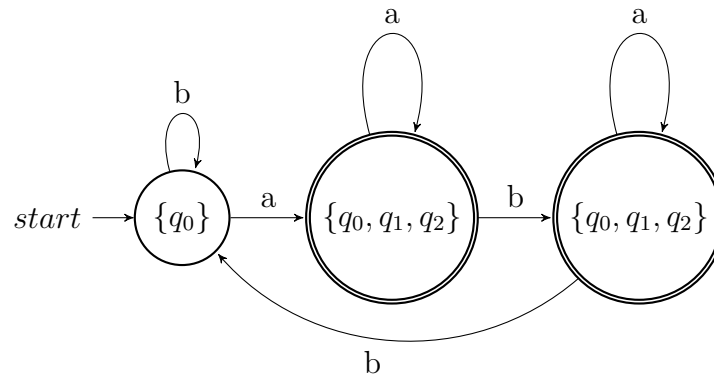


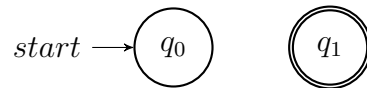
1.



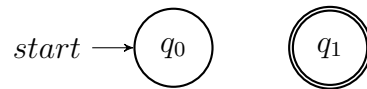
2. See attached code.

3. (a) $a(a+b)^*b$
 (b) $aaa(a+b)^*$
 (c) $000 + (0+1)^* + 000$
 (d) $(aa)^*a$
 (e) $(aa)^* + (aaa)^* + (aaaaa)^*$

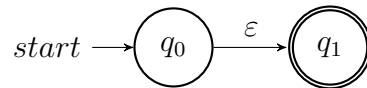
4. (a) Lemma-based construction:



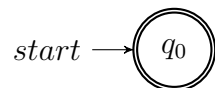
Smallest construction:



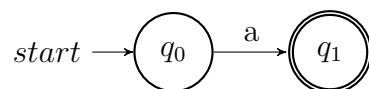
(b) Lemma-based construction:



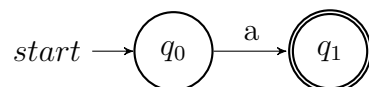
Smallest construction:



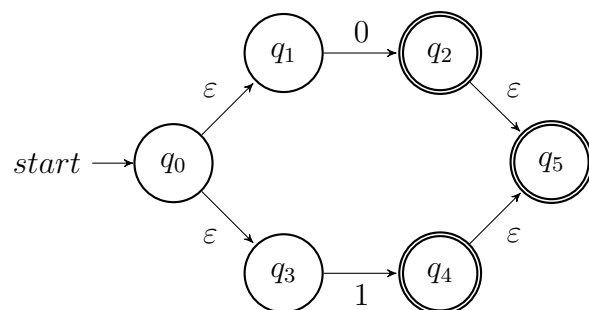
(c) Lemma-based construction:



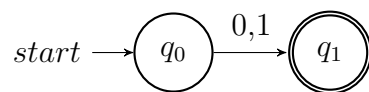
Smallest construction:



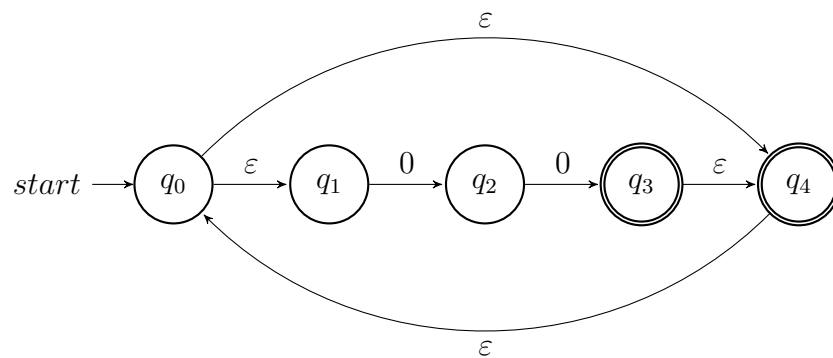
(d) Lemma-based construction:



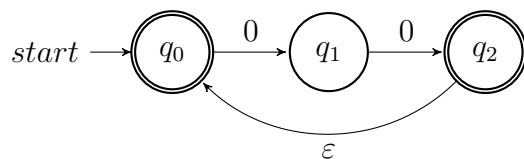
Smallest construction:



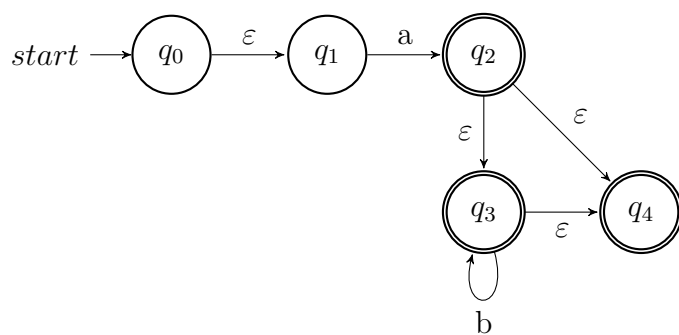
(e) Lemma construction:



Smallest construction:



(f) Lemma construction:



Smallest construction:

