16/02/21

Problem Sheet - 4

106119100

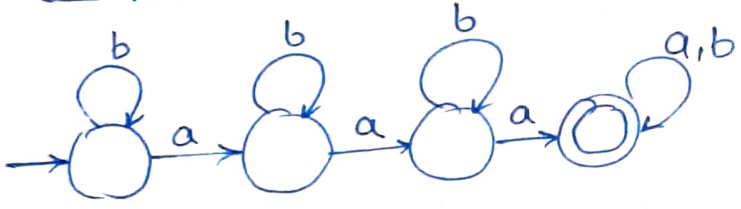
Question I :

(a) $\{w \mid w$ has at least three a's and at least two b's$\}$

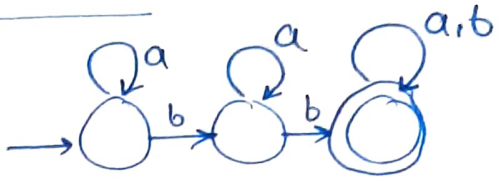
L_1 : at least three a's

L_2 : at least two b's

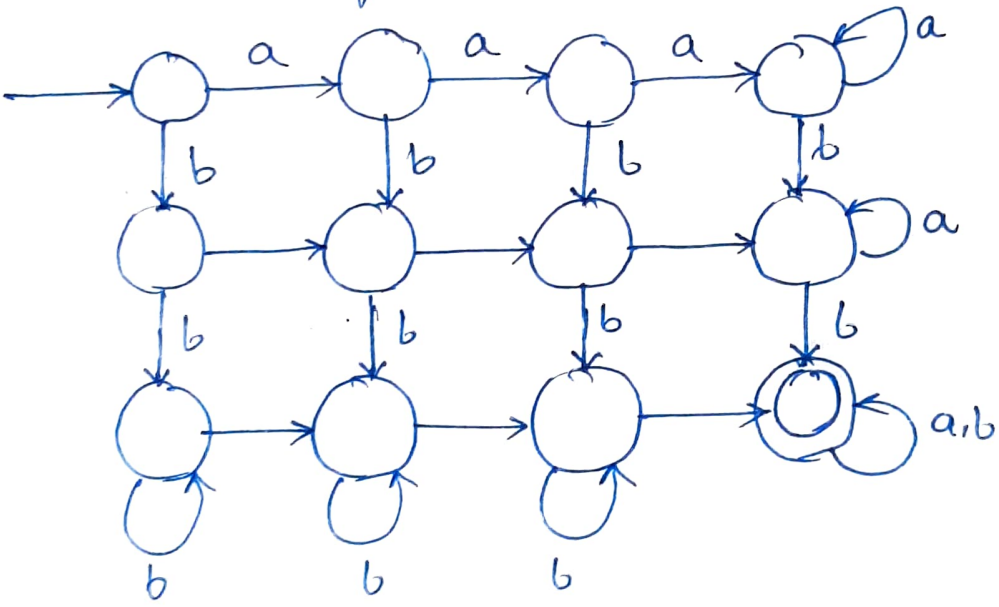
M_1 for L_1



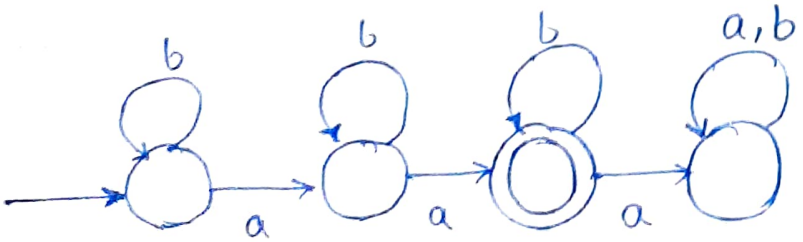
M_2 for L_2



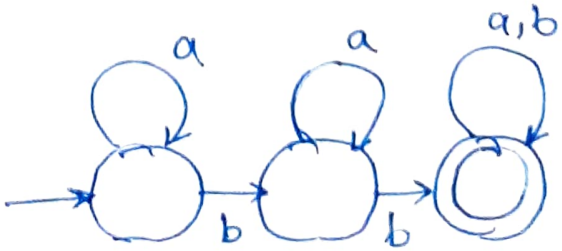
taking intersection of M_1 and M_2 :



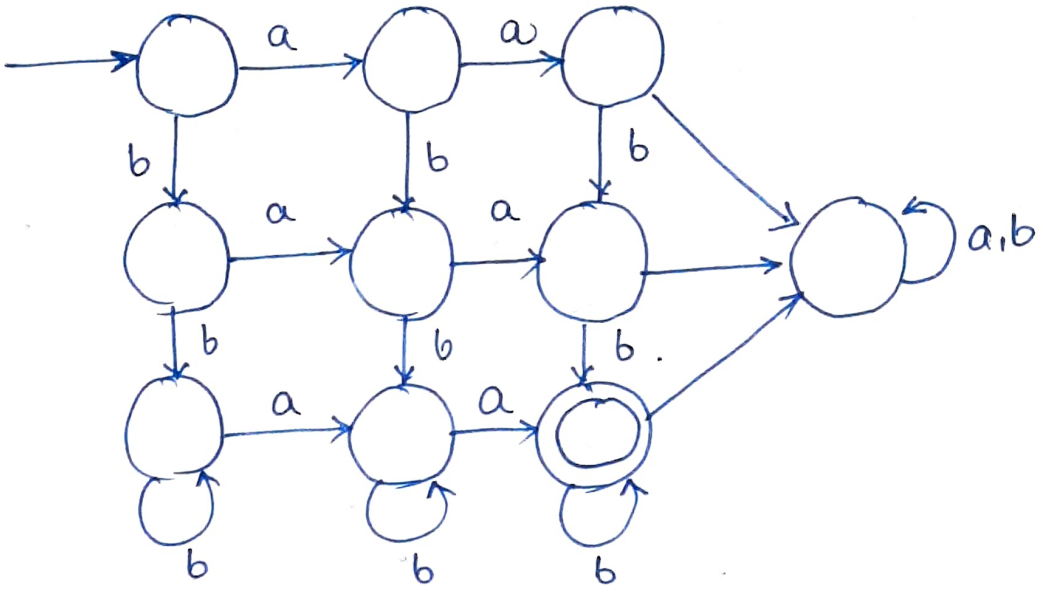
(b) $L = \{w \mid w$ has at exactly two a's and at least two b's$\}$



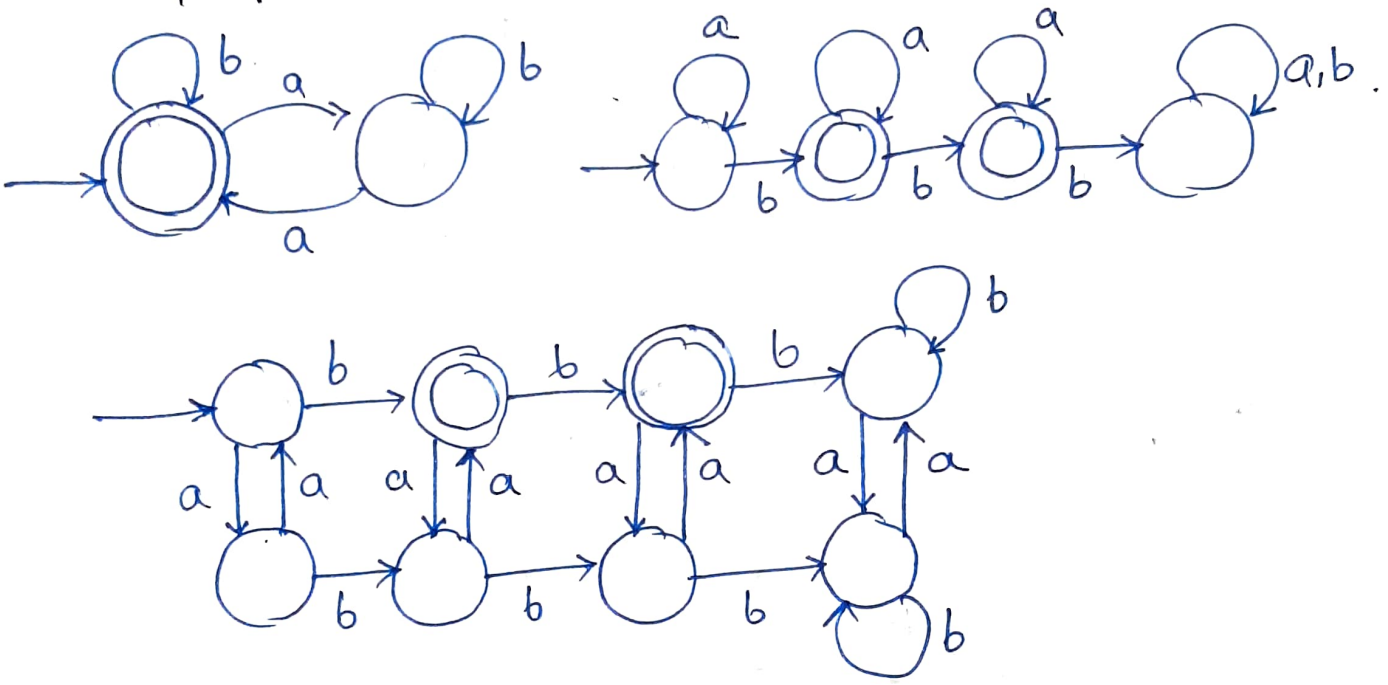
L_1



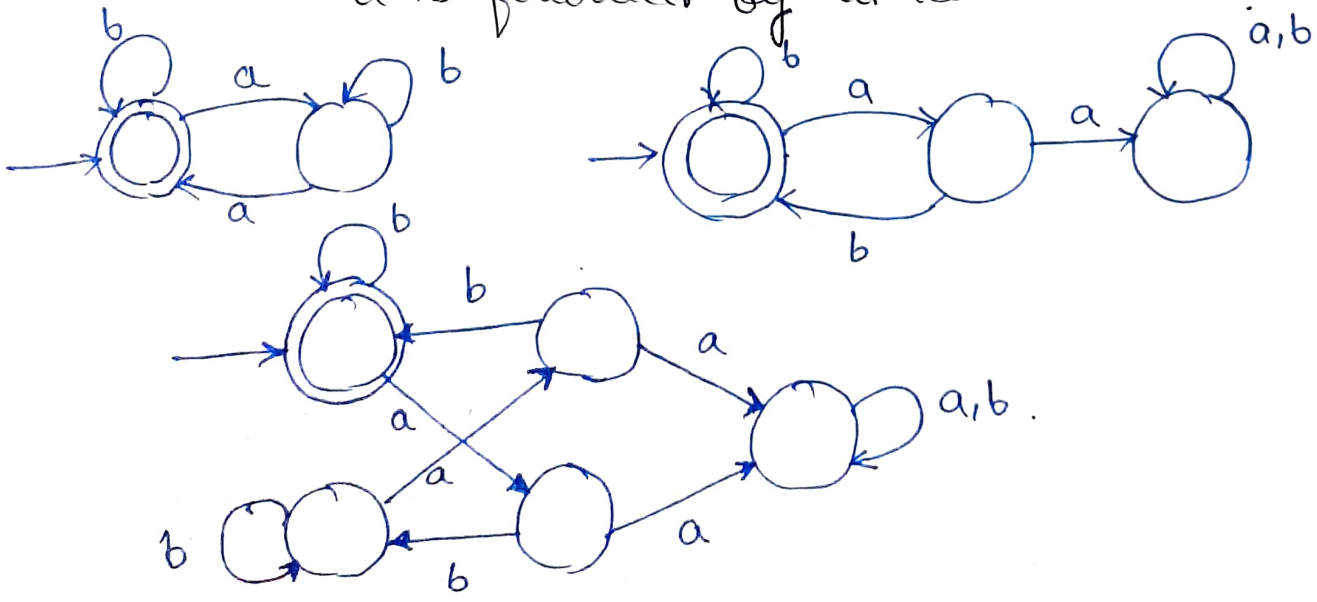
L_2



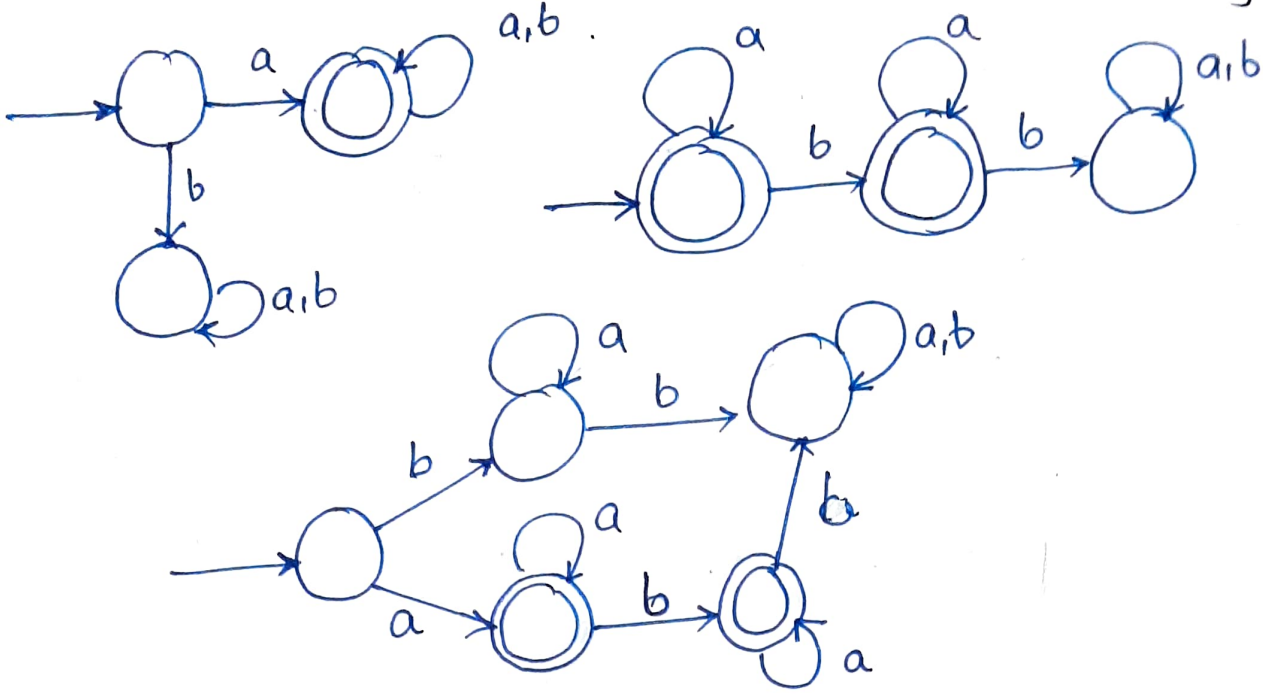
(c) $L = \{w \mid w$ has even number of a's and one or two b's$\}$.



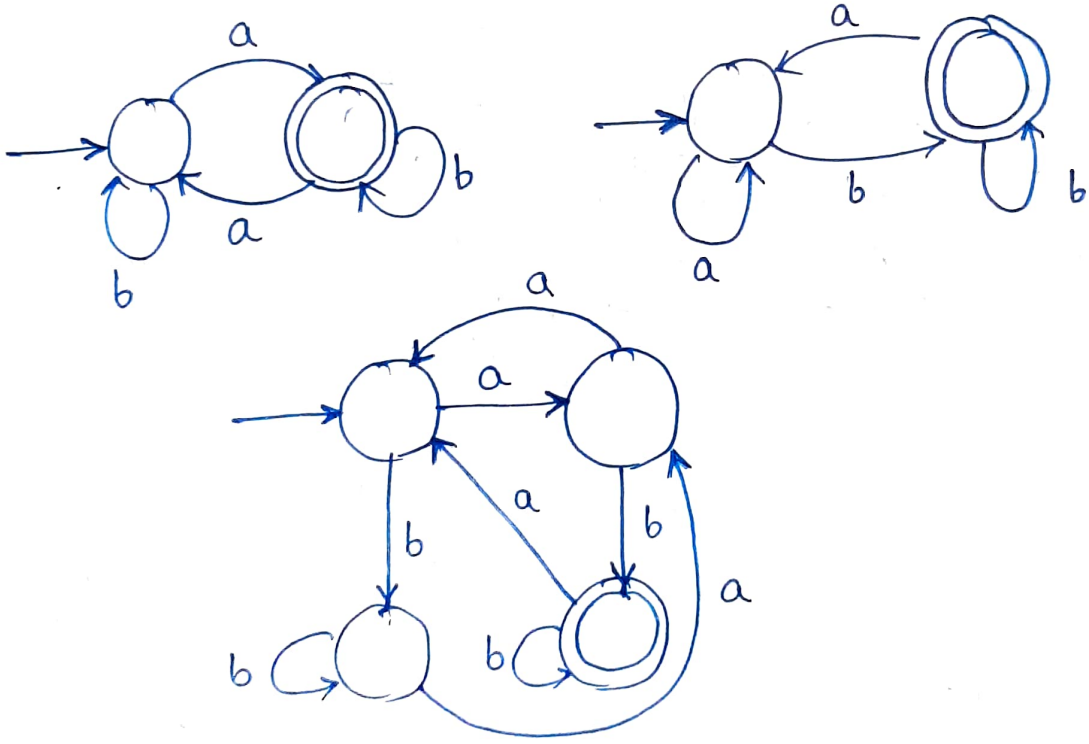
(d) $L = \{w \mid w$ has even number of a's and each a is followed by at least one b$\}$.



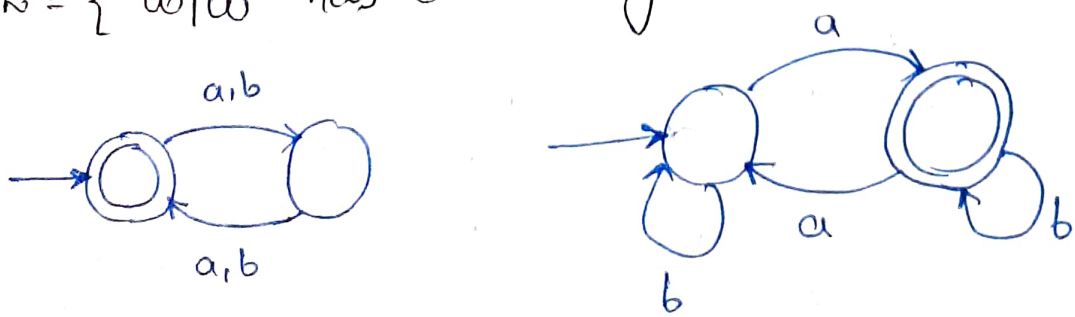
(e) $L = \{w \mid w$ starting with an 'a' and has at most one b$\}$

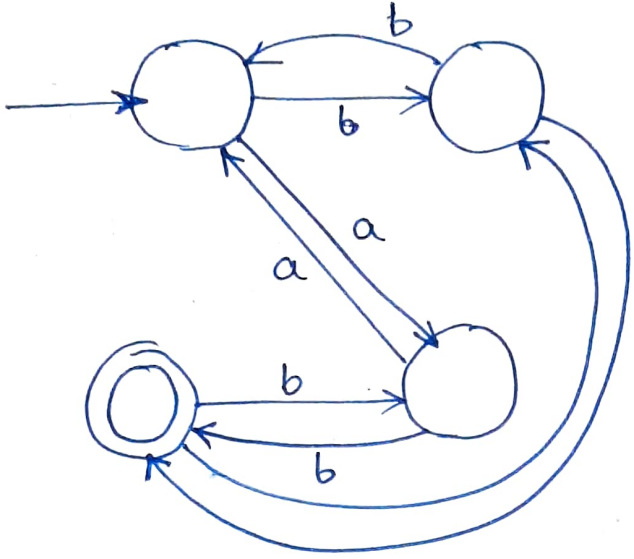


(f) $L = \{w \mid w$ has an odd number of a's and end with b$\}$



(g) $L = \{w \mid w$ has even lenght and an odd number a's$\}$

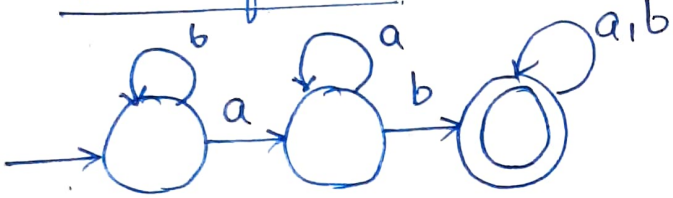




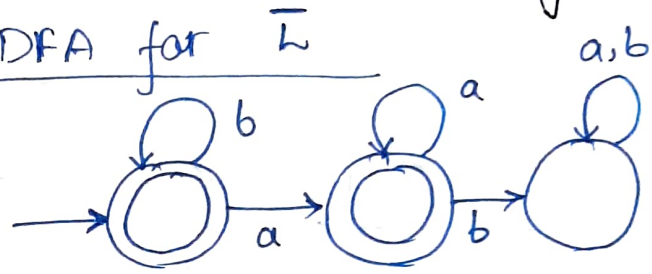
Question II

(a) $\bar{L} = \{w \mid w$ doest not contain the substring ab$\}$.

DFA for L

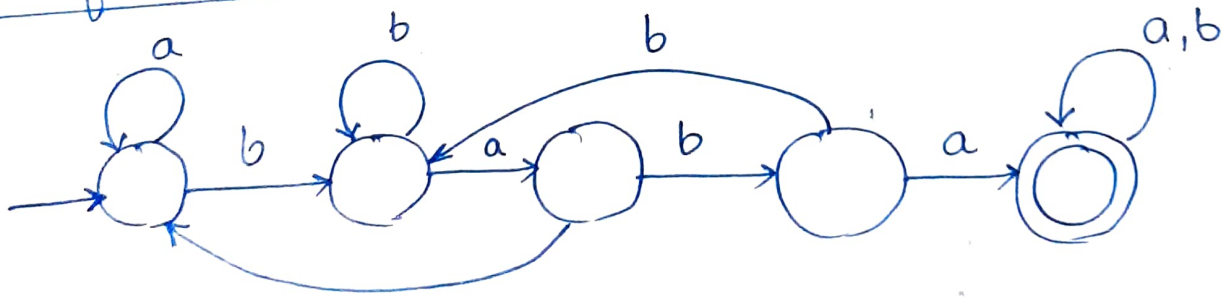


DFA for $\bar{L}$

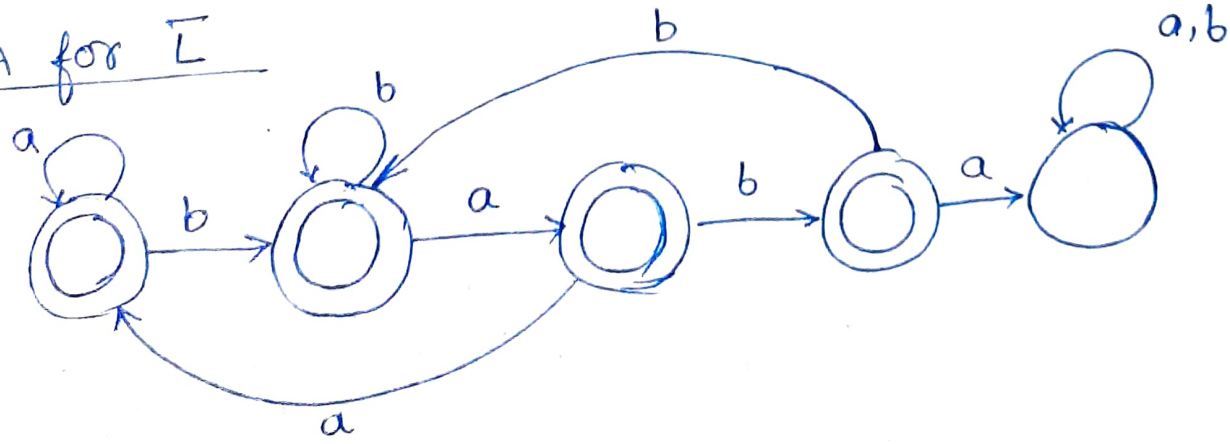


(b) $\bar{L} = \{w \mid w$ doest not contain the substring baba$\}$

DFA for L

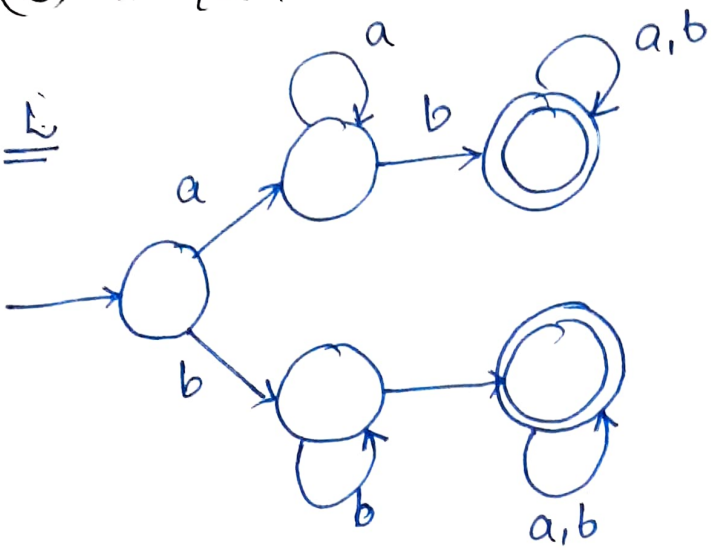


DFA for $\bar{L}$

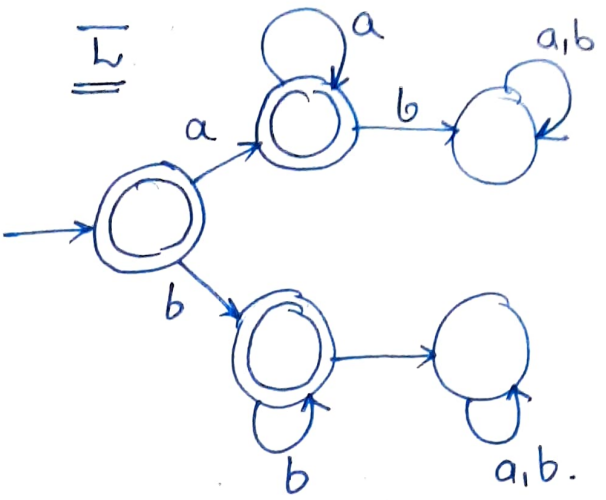


(c) $\bar{L} = \{w \mid w$ contains neither the substring ab nor ba $\}$

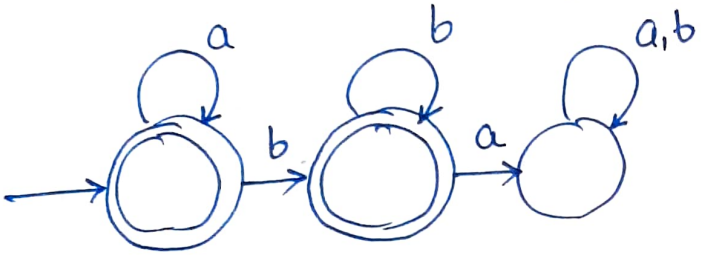
L

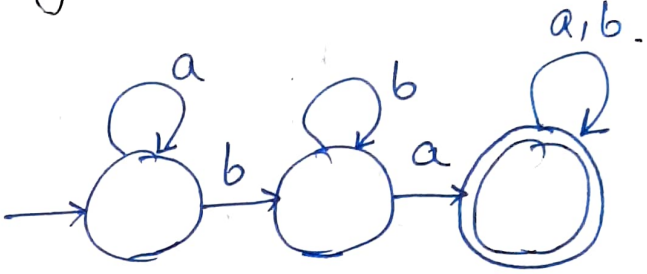


$\bar{L}$

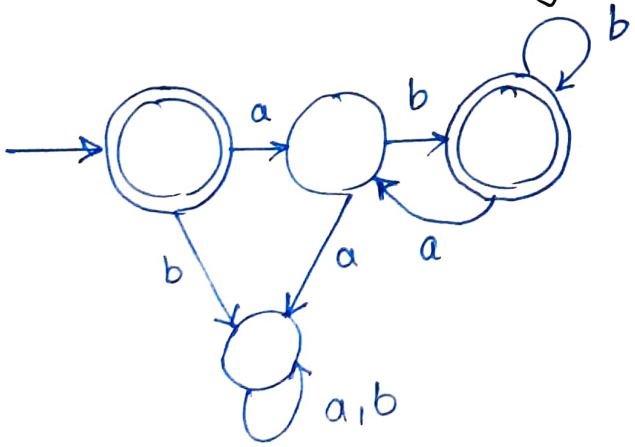


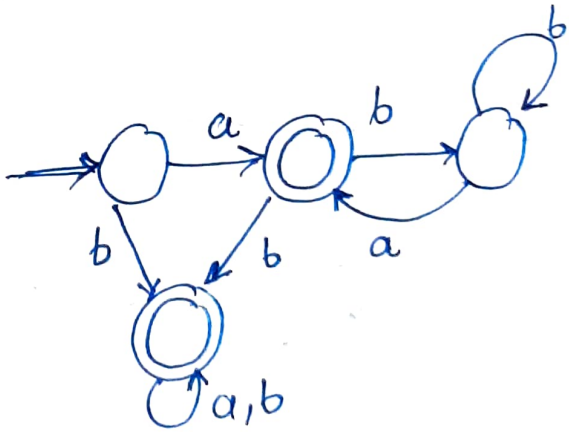
(d) $\bar{L} = \{w \mid w$ is any string not in $a^*b^*\}$



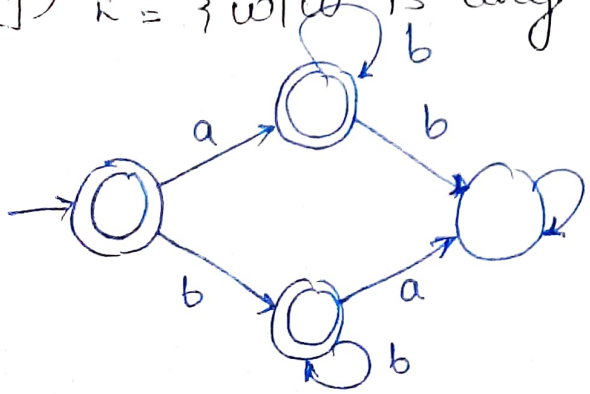


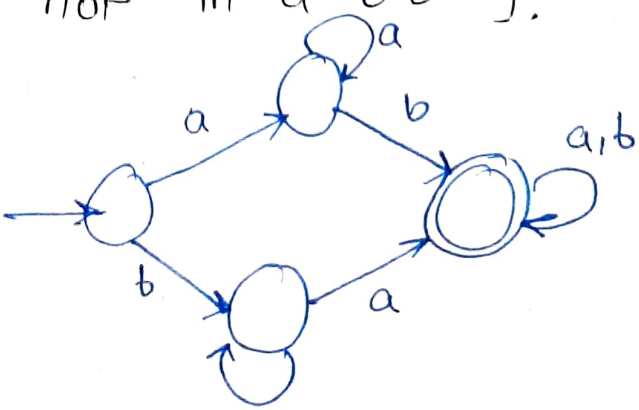
(e) $\bar{L} = \{w \mid w$ is any string not in $(ab^+)^*\}$



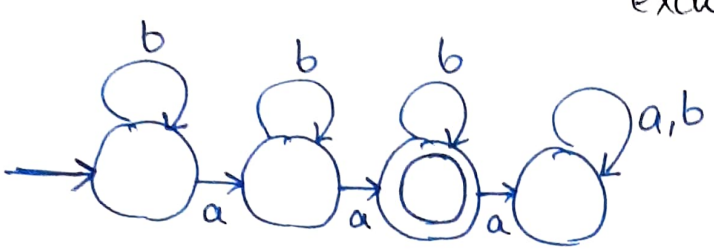


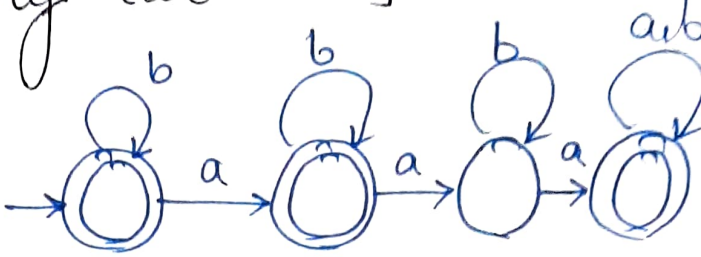
(f) $\bar{L} = \{w \mid w$ is any string not in $a^*ub^*\}$.





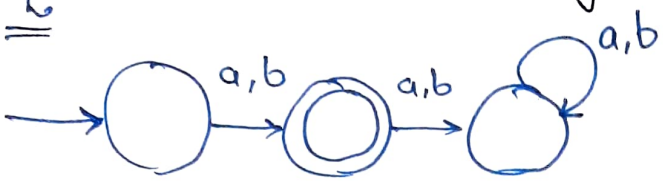
(g) $L = \{w \mid w$ is any string that doesn't contain exactly two a's $\}$





(h) $\bar{L} = \{w \mid w$ is any string except a and b $\}$.

$\bar{L}$



$\bar{L}$