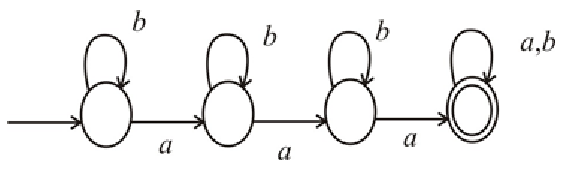
获得的答案 **返回**

a.

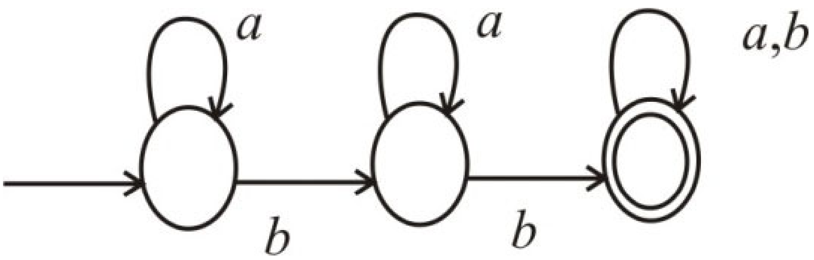
Consider the Language $L=\{w \mid w \text{ has at least three } a\text{'s and at least two } b\text{'s}\}$. The language *L* is the intersection of two simpler languages L_1 and L_2.

Now $L_1=\{w \mid w \text{ has at least three } a\text{'s}\}$and $L_2=\{w \mid w \text{ has at least two } b\text{'s}\}$. Let *M* be the DFA (Deterministic Finite automata) that recognizes *L*. Let M_1 and M_2 be the DFAs that recognizes L_1 and L_2.

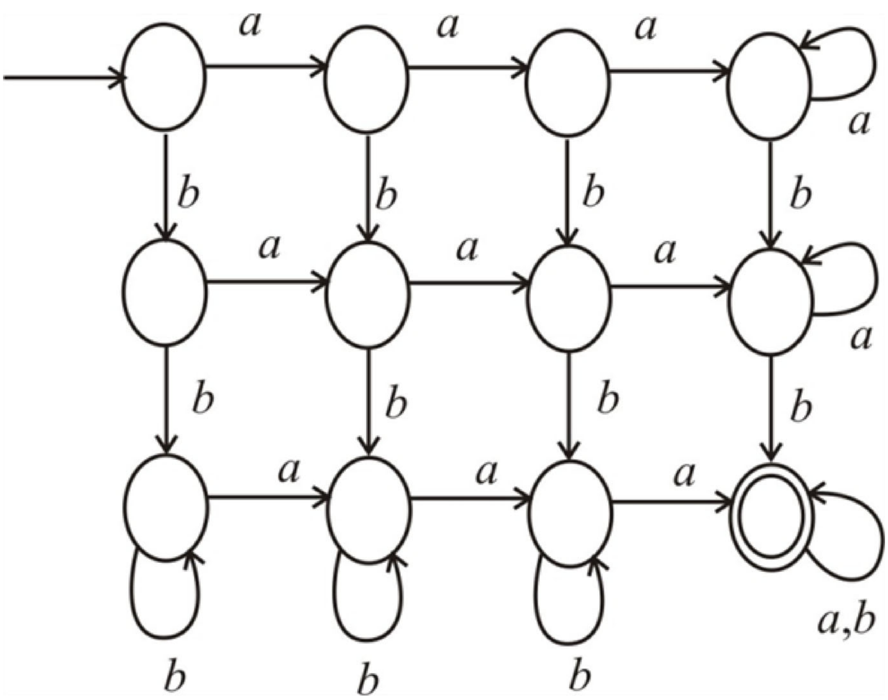
The state diagram of M_1 that recognizes $L_1=\{w \mid w \text{ has at least three } a\text{'s}\}$ is as follows:



The state diagram of M_2 that recognizes $L_2=\{w \mid w \text{ has at least two } b\text{'s}\}$ is as follows:



The machine *M* will accept the input if and only if both M_1 and M_2 accept it. Because, the language *L* is the intersection of the languages L_1 and L_2. Therefore, the state diagram of *M* that recognizes the Language L is as follows:

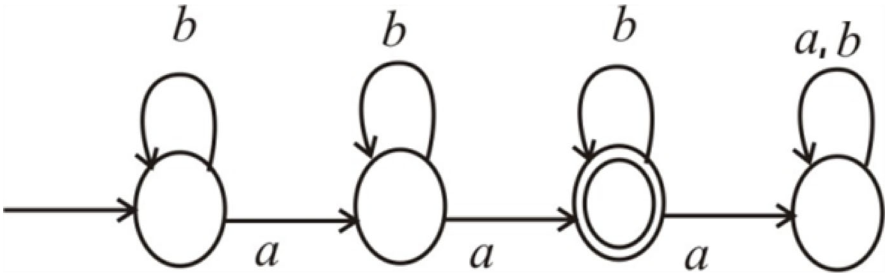


b.

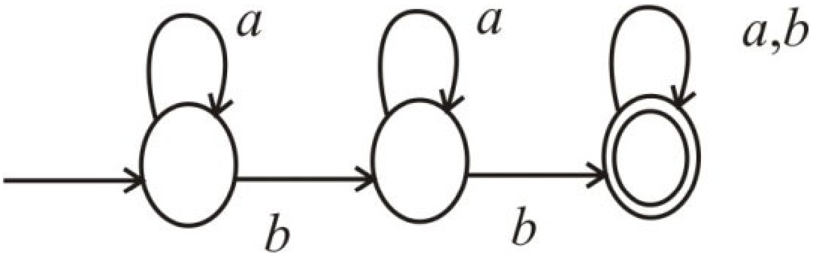
Consider the language $L=\{w \mid w$ has at exactly two *a*'s and at least two *b*'s}. The language *L* is the intersection of two simpler languages say L_1 and L_2.

Now $L_1=\{w \mid w$ has exactly two *a*'s} and $L_2=\{w \mid w$ has at least two *b*'s}. Let *M* be the DFA(Deterministic Finite automata) that recognizes *L* and M_1 and M_2 be the DFAs that recognizes L_1 and L_2.

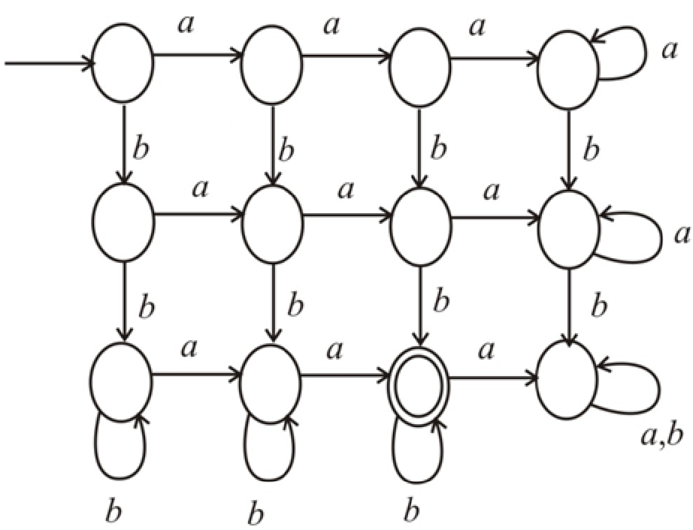
The state diagram of M_1 that recognizes L_1 is as follows



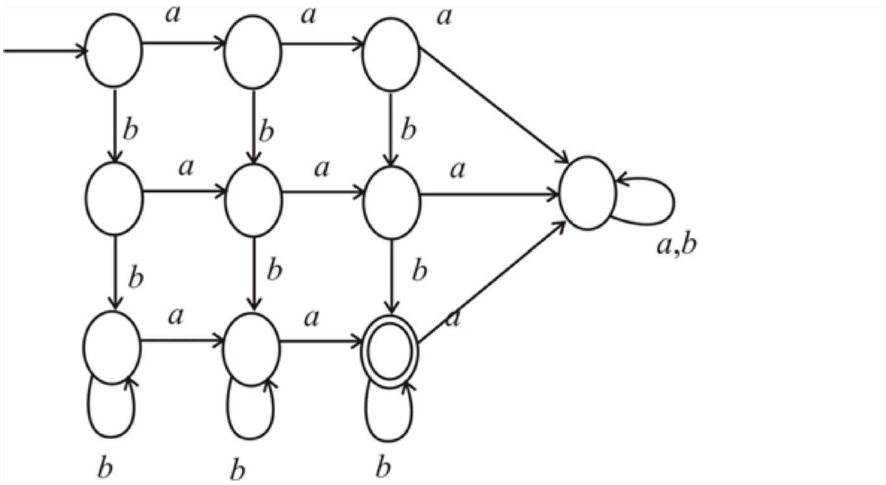
The state diagram of M_2 that recognizes L_2 is as follows



The machine *M* will accept the input if and only if both M_1 and M_2 accept it. Because, the language *L* is the intersection of L_1 and L_2. The state diagram of *M* that recognizes *L* is as follows:



Combine some states to get more simplified form as follows:

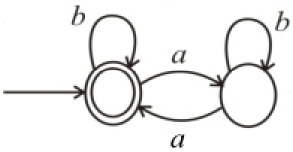


c.

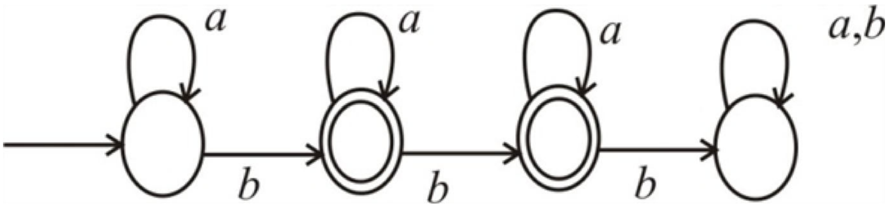
Consider the language $L = \{w \mid w$ has even number of *a*'s and one or two *b*'s}. The language *L* is the intersection of two simpler languages say L_1 and L_2.

Now $L_1 = \{w \mid w$ has even number of *a*'s } and $L_2 = \{w \mid w$ has one or two *b*'s}. Let *M* be the DFA(Deterministic Finite automata) that recognizes *L* and M_1 and M_2 be the DFAs that recognizes L_1 and L_2.

The state diagram of M_1 that recognizes L_1 is as follows

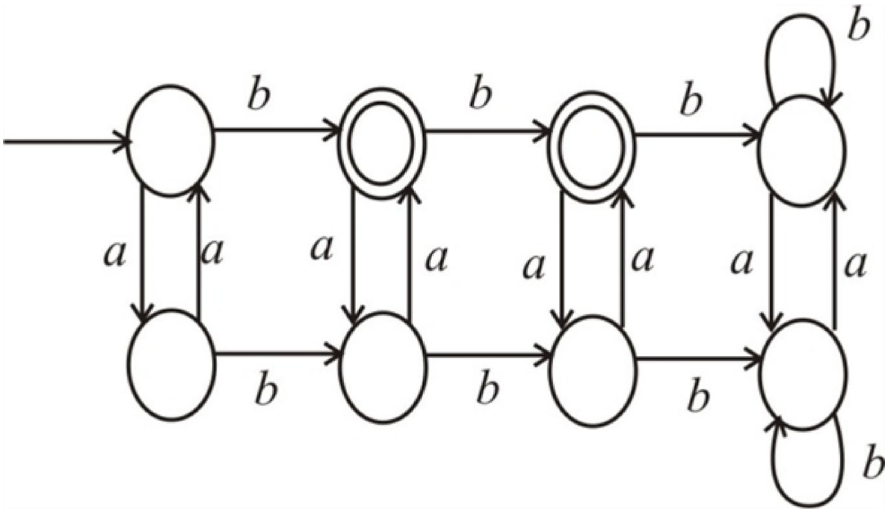


The state diagram of M_2 that recognizes L_2 is as follows



The machine *M* will accept the input if and only if both M_1 and M_2 accept it. Because language *L* is the intersection of L_1 and L_2.

The state diagram of *M* which recognizes the language *L* is as follows

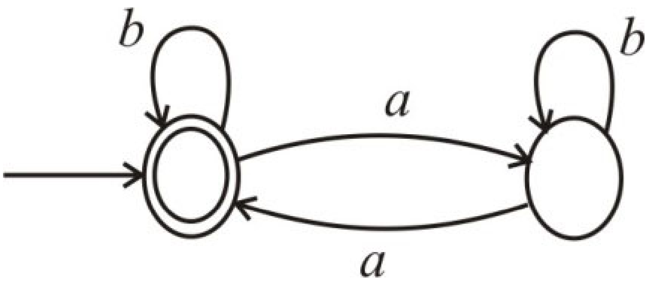


d.

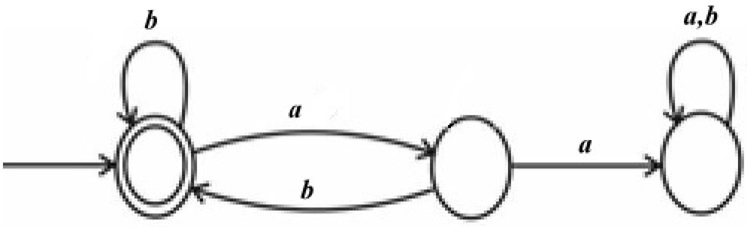
Consider the language $L = \{ w \mid w$ has an even number of *a*'s and each a is a followed by at least on *b*}. The language *L* is the intersection of two simpler languages say L_1 and L_2.

Now $L_1 = \{ w \mid w$ has an even number of *a*'s } and $L_2 = \{ w \mid w$ has each a is a followed by at least on *b* }. Let *M* be the DFA(Deterministic Finite automata) that recognizes *L* and M_1 and M_2 be the DFAs that recognizes L_1 and L_2.

The state diagram of M_1 that recognizes L_1 is as follows where $L_1 = \{ w \mid w$ has an even number of *a*'s}.

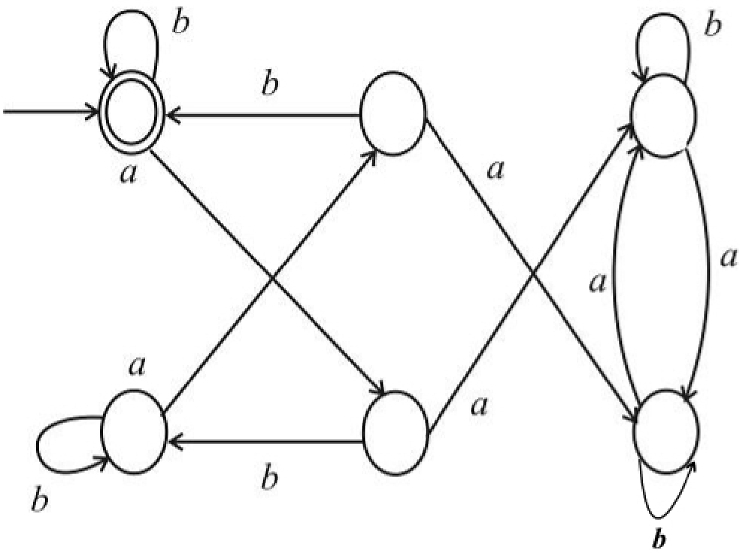


The state diagram of M_2 that recognizes L_2 is as follows where $L_2 = \{ w \mid w$ has each *a* is followed by at least one *b*}.

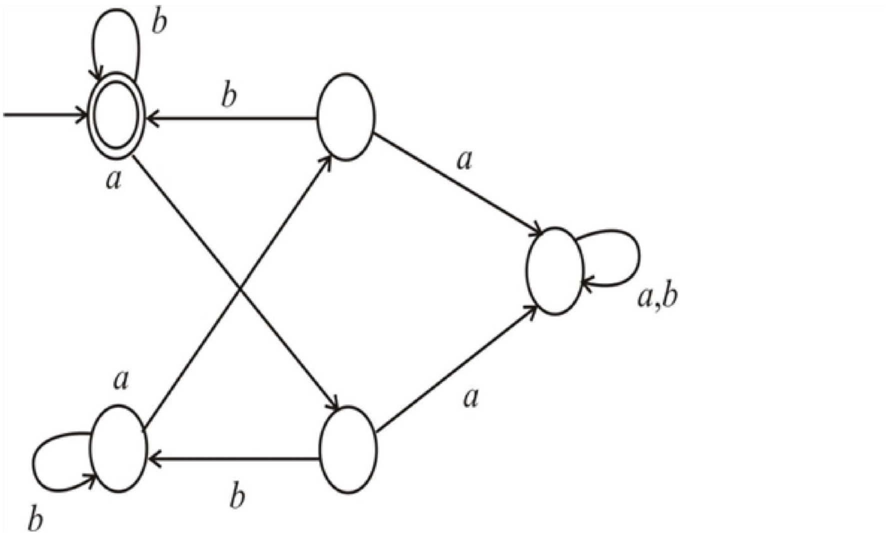


The machine *M* will accept the input if and only if both M_1 and M_2 accept it. Because, the language *L* is the intersection of L_1 and L_2.

The state diagram of *M* that recognizes *L* is as follows:



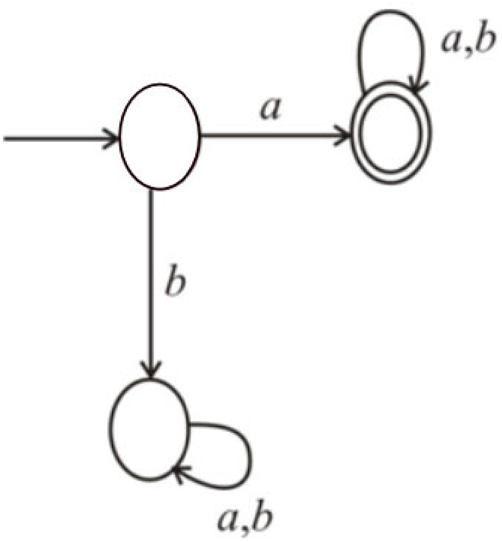
Combine some states to get more simplified form as follows:



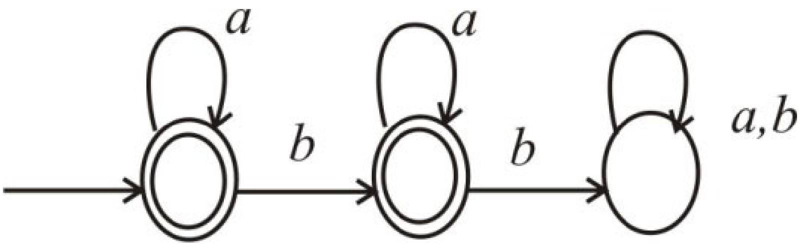
e.

Consider the language $L = \{w \mid w$ Start with an a and has at most one $b\}$. The language L is the intersection of two simpler languages say L_1 and L_2. Now $L_1 = \{w \mid w$ starts with $a\}$and $L_2 = \{w \mid w$ has at most one $b\}$. Let M be the DFA(Deterministic Finite automata) that recognizes L and M_1 and M_2 be the DFAs that recognizes L_1 and L_2.

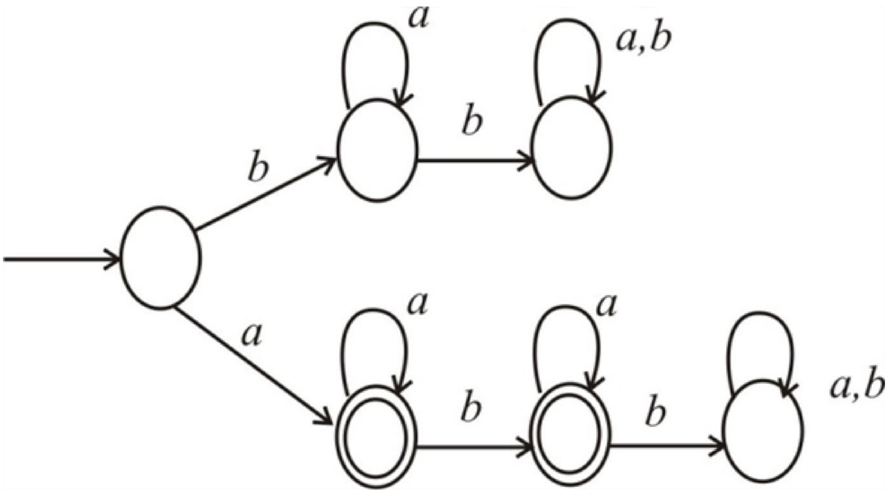
The state diagram of M_1 that recognizes L_1 is as follows:



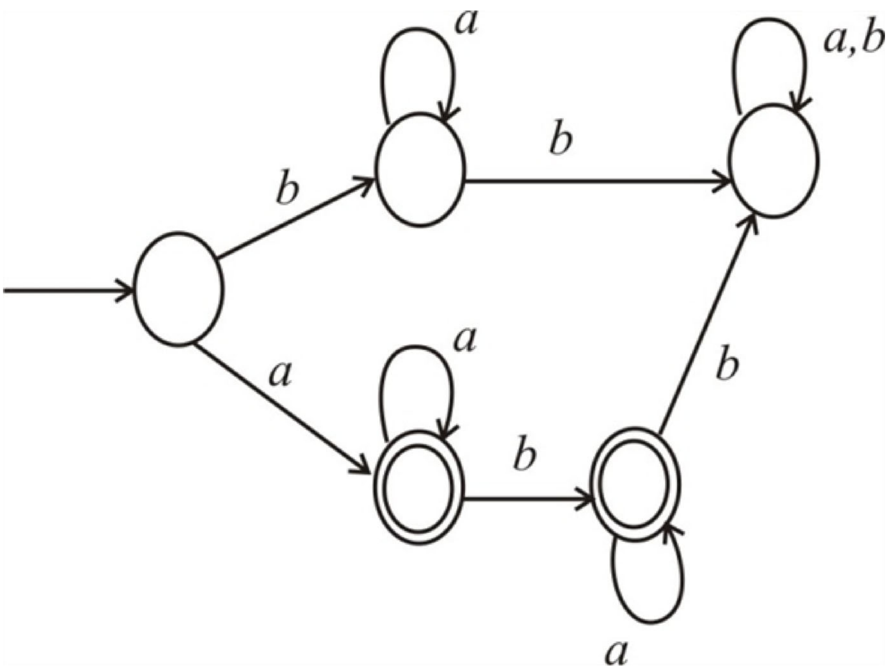
The state diagram of M_2 that recognizes L_2 is as follows.



The machine *M* will accept the input if and only if both M_1 and M_2 accept it. Because, the language *L* is the intersection of L_1 and L_2. The state diagram of *M* that recognizes *L* is as follows.



Combine some states to get more simplified form as follows:

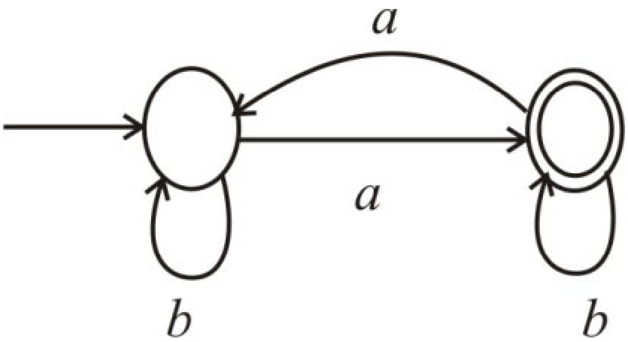


f.

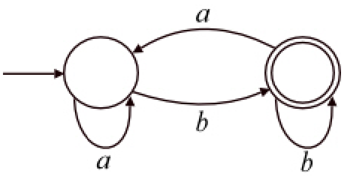
Consider the language $L = \{w \mid w$ has an odd number of *a*'s and ends with *b*}. The language *L* is the intersection of two simpler languages say L_1 and L_2. Now $L_1 = \{w \mid w$ has an odd

number of *a*'s} and $L_2 = \{w \mid w$ ends with a *b*}. Let *M* be the DFA(Deterministic Finite automata) that recognizes *L* and M_1 and M_2 be the DFAs that recognizes L_1 and L_2.

The state diagram of M_1 that recognizes L_1 is as follows:

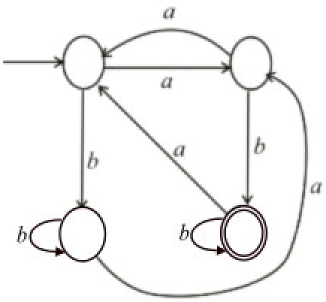


The language L_2 accepts the strings that ends with a symbol *b*. The state diagram of M_2 that recognizes L_2 is as follows:



The machine *M* will accept the input if and only if both M_1 and M_2 accept it. Because, the language *L* is the intersection of L_1 and L_2.

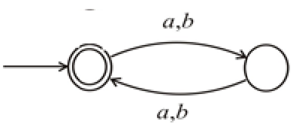
The state diagram of *M* that recognizes *L* is as follows:



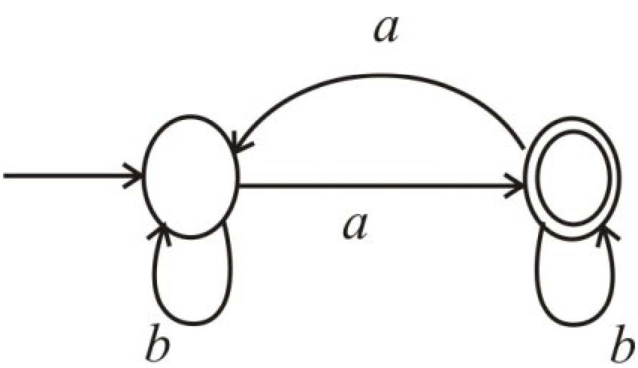
g.

Consider the language $L = \{w \mid w$ has even length and an odd number of *a*'s }. The language *L* is the intersection of two simpler languages say L_1 and L_2. Now $L_1 = \{w \mid w$ has even length } and $L_2 = \{w \mid w$ has odd number of *a*'s }. Let *M* be the DFA(Deterministic Finite automata) that recognizes *L* and M_1 and M_2 be the DFAs that recognizes L_1 and L_2.

State diagram of M_1 that recognizes L_1 is as follows

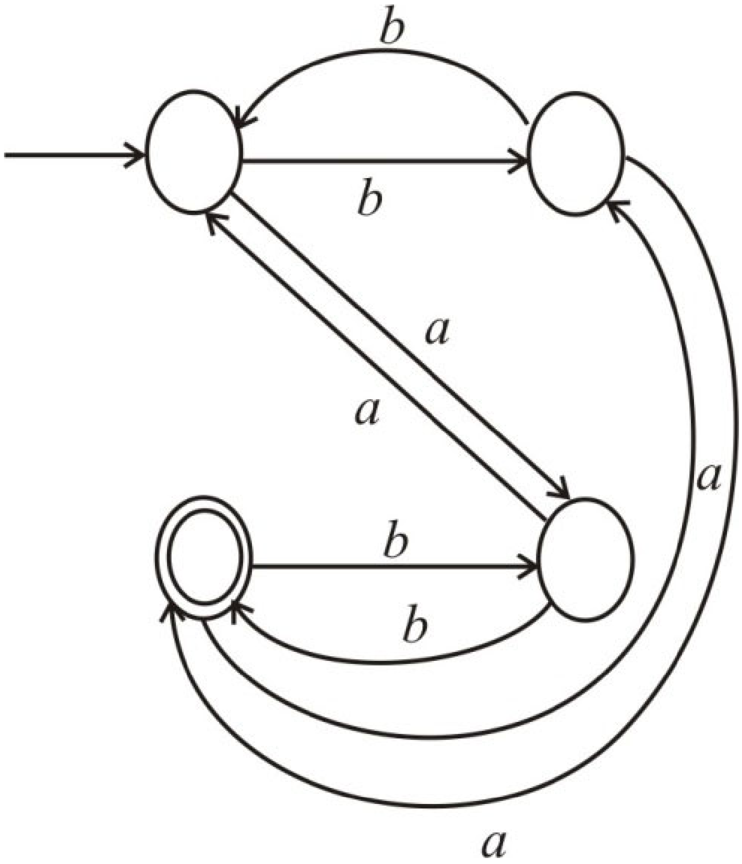


State diagram of M_2 that recognizes L_2 is as follows



The machine *M* will accept the input if and only if both M_1 and M_2 accept it. Because, the language *L* is the intersection of L_1 and L_2.

The state diagram of *M* that recognize *L* is as follows: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