MINIMIZATION OF DFA

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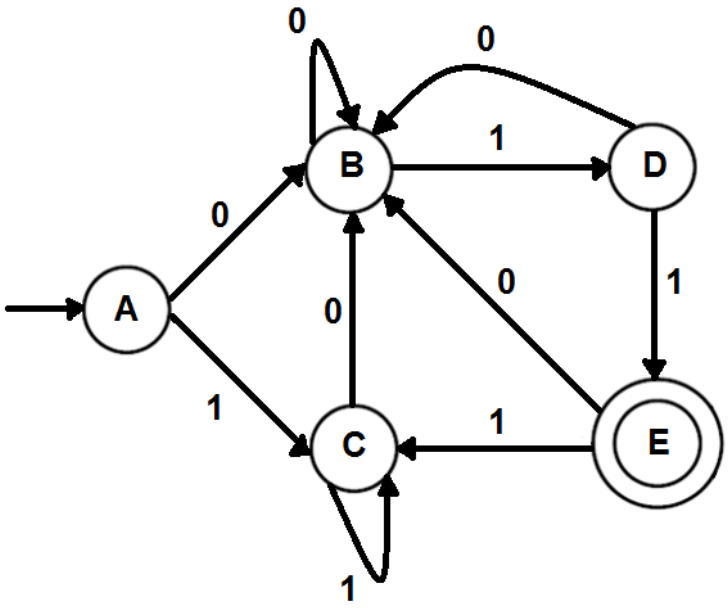
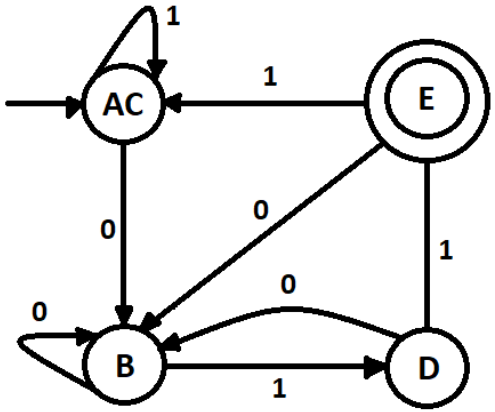
- Minimization of DFA is required to obtain the minimal version of any DFA which consists of the minimum number of states possible.
- Two states A and B are said to be equivalent if **$\delta(A,x) \rightarrow F$ and $\delta(B,x) \rightarrow F$ or $\delta(A,x) \not\rightarrow F$ and $\delta(B,x) \not\rightarrow F$**
  - Where x is any input string
- If $|x| = 0$, then A and B are said to be 0 equivalent
- If $|x| = 1$, then A and B are said to be 1 equivalent
- If $|x| = 2$, then A and B are said to be 2 equivalent
- If $|x| = n$, then A and B are said to be n equivalent



	0	1
→A	B	C
B	B	D
C	B	C
D	B	E
* E	B	C

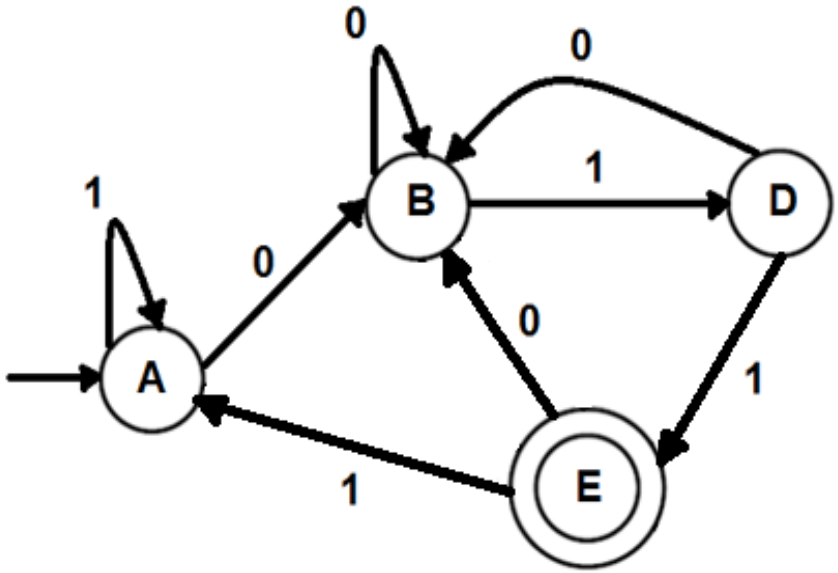
0 EQUIVALENCE:
{A,B,C,D} {E}
1 EQUIVALENCE:
{A,B,C} {D} {E}
2 EQUIVALENCE:
{A,C} {B} {D} {E}
3 EQUIVALENCE:
{A,C} {B} {D} {E}

	0	1
→AC	B	AC
B	B	D
D	B	E
* E	B	AC



EXAMPLE

- 1.)



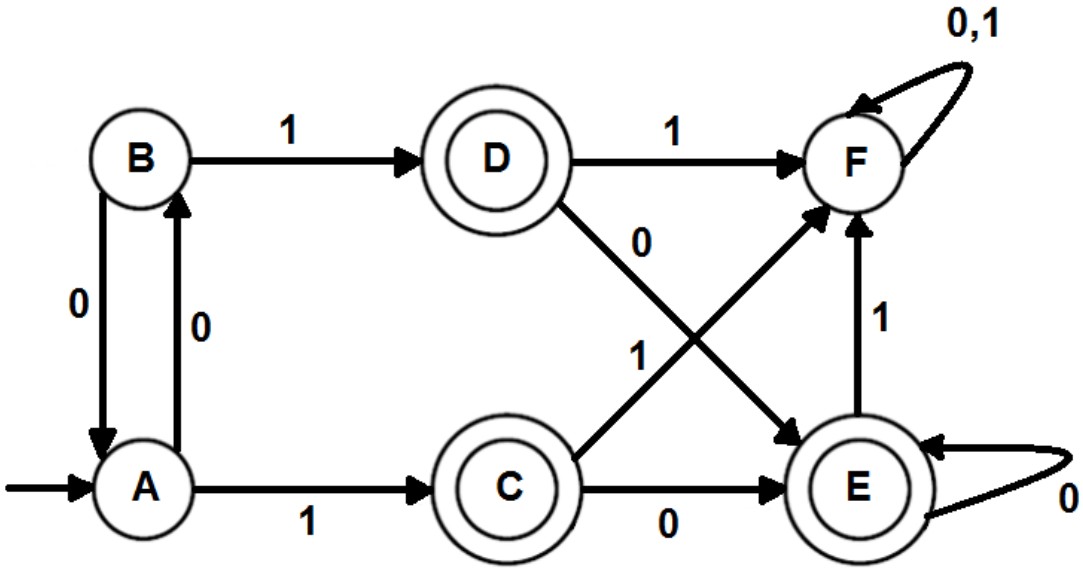
MORE EXAMPLE

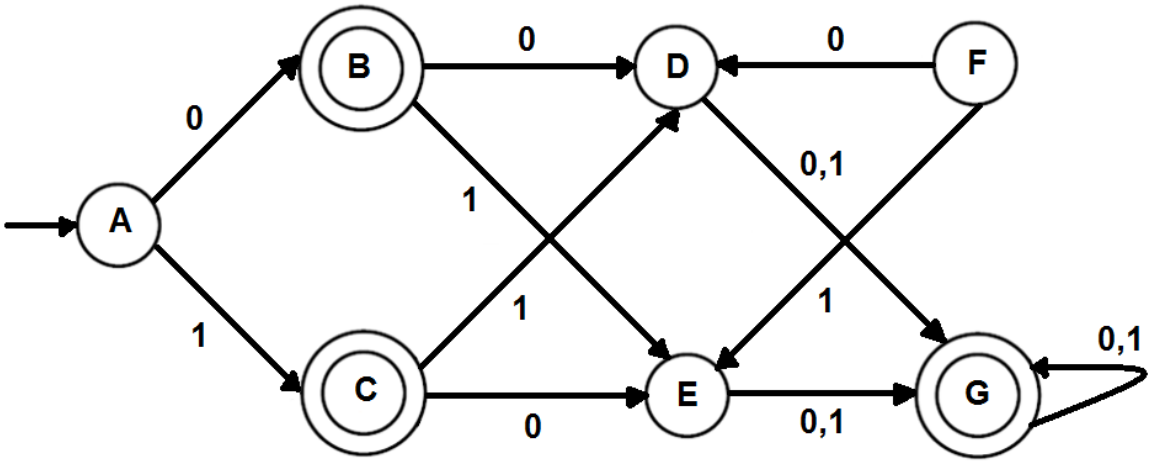
- 2.)

	a	b
→1	2	6
2	7	3
* 3	1	3
4	3	7
5	8	6
6	3	7
7	7	5
8	7	3

MORE EXAMPLE

- 3.) multiple final states



MORE EXAMPLE

- 4.) unreachable state