

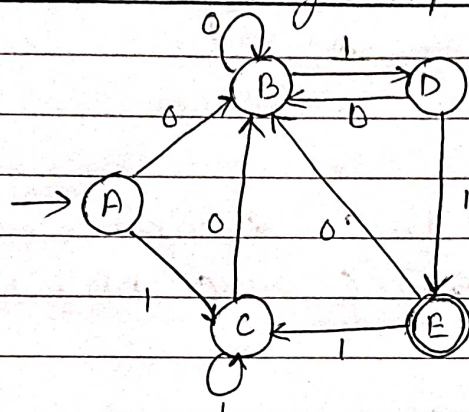


Minimization of DFA

(equivalent method)

Let us understand by example :-

Example



Solution First Draw transition Table :-

State	0	1
→ A	B	C
B	B	D
C	B	C
D	B	E*
* E	B	C

Step-1 Form pairs of final and non final states that is 0-equivalence

$$0 \text{ equivalence} = \{A, B, C, D\} \{E\}$$

Step-2 Find 1 equivalence from 0 equivalence pairs who are not separate

↳ For writing one equivalence we need to check if each pair lie in same set or not

$$1 \text{ equivalence} = \{A, B, C, D\} \{E\}$$

⇒ check for A, B for each input i.e. 0, 1

here A and B fall in same state for input 0 but for input 1 A goes to C and B goes to D here states differ now check if C and D lie in same set. Here C, D lie in same set.

lies in same set

⇒ now check for C with A or B since currently A = B we can check with A or B

let us check for C, A, for (C, 0) and (A, 0) both go to same state ~~B~~ and (C, 1) and (A, 1) also goes to same state.

⇒ now check for D with either of A, B or C, let's check with A, D for (A, 0) and (D, 0) both go on same state i.e. B and for (A, 1) and (D, 1) both go to different state and different set. A state lies in same set for input 1 but for input 1 of D goes to E. so separate it.

$$1 \text{ equivalence} = \{A, B, C\} \{D\} \{E\}$$

Step-3 Now check A, B, C together for 2 equivalence, here A, B, C goes to same state B on input 0 but on input 1, A and C on input goes to C and C lies in same set but B goes to D which lies in different set. now make B as separate set

$$2 \text{ equivalence} = \{A, C\} \{B\} \{D\} \{E\}$$

Step-4 Now this cannot be further solved as for all equivalences i.e. 3, 4, 5 the answer will remain same. so now construct DFA.

