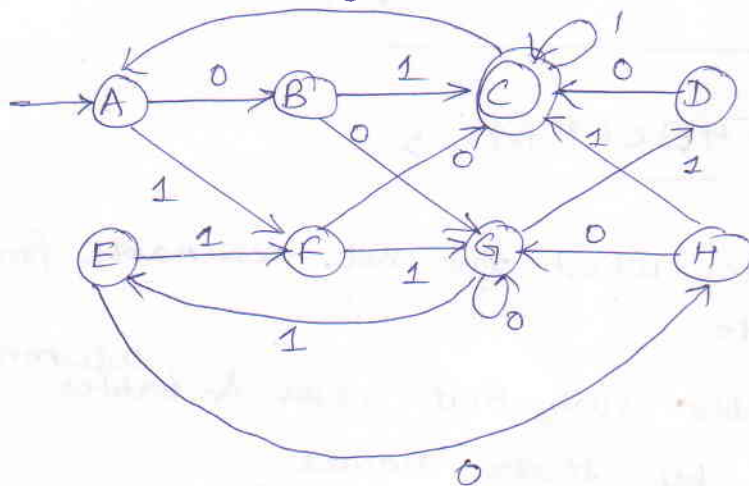


eg1) Construct a minimized DFA for the following



↳ Transition Table

States	Inputs	
	0	1
A	B	F
B	G	C
C	A	C
E	H	F
F	C	G
G	G	E
H	G	C

"D" is removed from transition table as it is a dead state.

↳ Box Table

Second to last ↓	B	X					
	C	X	X				
	E		X	X			
	F	X	X	X	X		
	G	X	X	X	X	X	
	H	X		X	X	X	X
		A	B	C	E	F	G

→ first to Second last

All states in which one state is C i.e. final state & other is non-final are crossed

- 1) cell (A, B)
 $\delta(A, 0) = B$
 $\delta(B, 0) = G$
 (B, G) is not marked.
 $\delta(A, 1) = F$
 $\delta(B, 1) = C$
 (F, C) is marked so (A, B) is also crossed.

- 2) cell (A, E)
 $\delta(A, 0) = B$
 $\delta(E, 0) = H$
 (B, H) is not marked,
 $\delta(A, 1) = F$
 $\delta(E, 1) = F$, so (A, E) is not crossed
~~(F, C) is crossed so (A, E) is also crossed.~~

- 3) cell (A, F)
 $\delta(A, 0) = B$
 $\delta(F, 0) = C$
 Since (B, C) is crossed, cell (A, F) is also crossed.

- 4) cell (A, H)
 $\delta(A, 0) = B$
 $\delta(H, 0) = G$
 (B, G) is not crossed.
 $\delta(A, 1) = F$
 $\delta(H, 1) = C$
 (F, C) is crossed, so (A, H) is also crossed.

- 5) cell (A, G)
 $\delta(A, 0) = B$
 $\delta(G, 0) = G$
 (B, G) is not crossed
 $\delta(G, 1) = E$
 $\delta(A, 1) = F$
 (F, E) is not crossed, thus (A, G) unmarked.

6) Cell (B, E)

$$\delta(B, 0) = G$$

$$\delta(E, 0) = H$$

(G, H) is not crossed, thus

$$\delta(B, 1) = C$$

$$\delta(E, 1) = F$$

(F, C) is crossed, thus (B, E) is crossed.

7) (B, F)

$$\delta(B, 0) = G$$

$$\delta(F, 0) = C$$

(G, C) is crossed, thus (B, F) is crossed.

8) (B, G)

$$\delta(B, 0) = G$$

$$\delta(G, 0) = G$$

$$\delta(B, 1) = C$$

$$\delta(G, 1) = E$$

(C, E) is crossed, thus (B, G) is crossed.

9) (B, H)

$$\delta(B, 0) = G$$

$$\delta(H, 0) = G$$

$$\delta(B, 1) = C$$

$$\delta(H, 1) = C$$

10) (E, F)

$$\delta(E, 0) = H$$

$$\delta(F, 0) = C$$

(H, C) is marked, thus (E, F) is also crossed.

11) $(E, G) \Rightarrow$

$$\delta(E, 0) = H$$

(G, H) is not marked

$$\delta(G, 0) = G$$

$$\delta(E, 1) = F$$

$$\delta(G, 1) = E$$

(E, F) is crossed so (E, G) is also crossed.

(E, H)

$$\delta(E, 0) = H$$

12) $\delta(H, 0) = G$

(G, H) is not marked.

$$\delta(E, 1) = F$$

$$\delta(H, 1) = C$$

(F, C) is marked, thus (E, H) is marked.

13) (F, G)

$$\delta(F, 0) = C$$

$$\delta(G, 0) = G$$

(G, C) is marked, thus (F, G) is also marked.

14) (F, H)

$$\delta(F, 0) = C$$

$$\delta(H, 0) = G$$

(C, G) is marked, hence (F, H) is marked.

15) (G, H)

$$\delta(G, 0) = G$$

$$\delta(H, 0) = G$$

$$\delta(G, 1) = E$$

$$\delta(H, 1) = C$$

(E, C) is marked, hence (G, H) is marked.

Now after 1 iteration, we again check for all unmarked cells.

We find that cell (A, G) gets marked as (F, E) gets crossed later.

cell (B, H) is not marked thus B is equivalent to H
 and they can be combined to form a composite state [B H]
 cell (A, E) is not marked, thus A is equivalent to E & can
 be combined to form a composite state [A E]
 Thus, minimized DFA is

	0	1
→ [A E]	[B H]	F
[B H]	G	C
C	[A E]	C
F	C	G
G	G	[A E]

