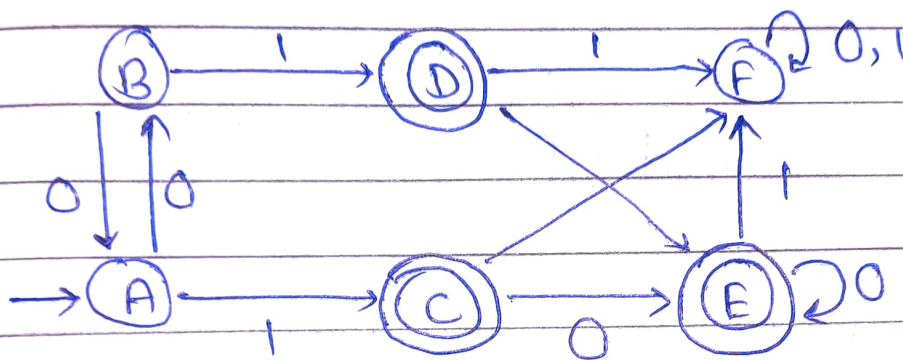


TOC Assignment no. 3

Name: Shivam Tawasi

Roll no: A-58

①



	0	1
→ A	B	C
B	A	D
C	E	F
D	E	F
E	E	F
F	F	F

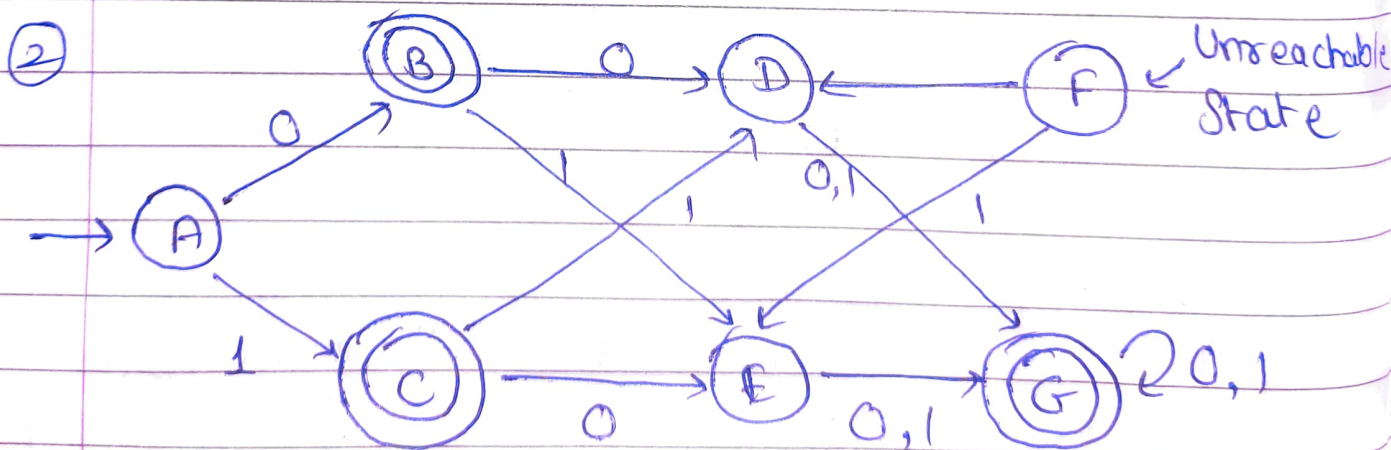
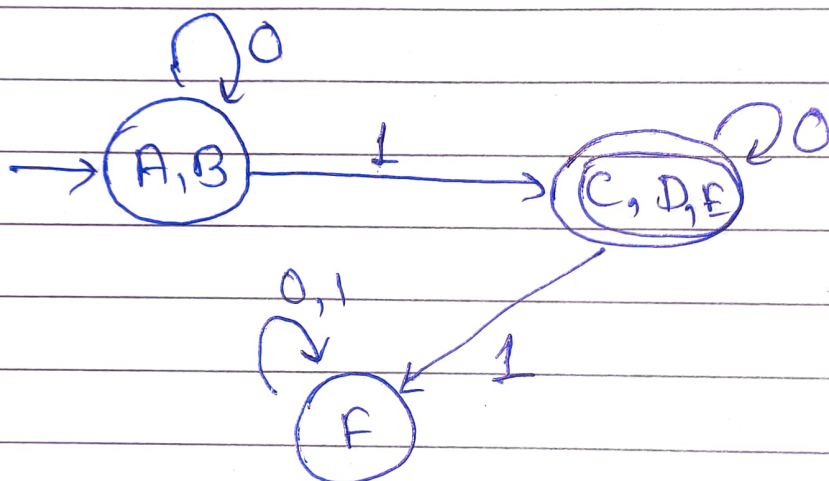
0-Equivalence - $\{A, B, F\} \{C, D, E\}$

1-Equivalence - $\{A, B\} \{F\} \{C, D, E\}$

2-Equivalence - $\{A, B\} \{F\} \{C, D, E\}$

	0	1
$\rightarrow \{A, B\}$	$\{A, B\}$	$\{C, D, E\}$
$\{F\}$	$\{F\}$	$\{F\}$
$\{C, D, E\}$	$\{C, D, E\}$	$\{F\}$

Minimized DFA:



	0	1
→ A	B	C
(B)	D	F
(C)	E	D
D	G	G
E	G	G
(G)	G	G

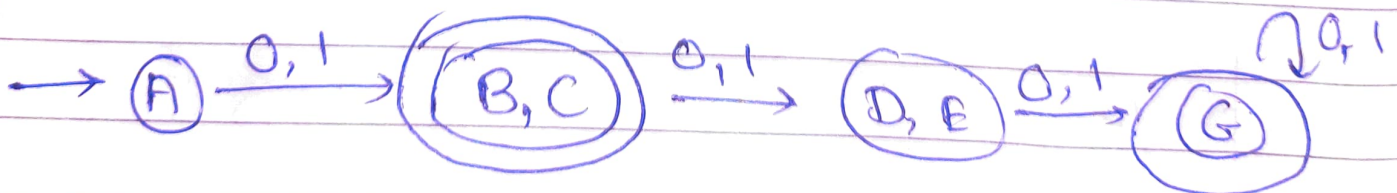
0 - Equivalence : { A, D, E } { B, C, G }

1 - Equivalence : { A, D, E } { B, C } { G }

2 - Equivalence : { A } { D, E } { B, C } { G }

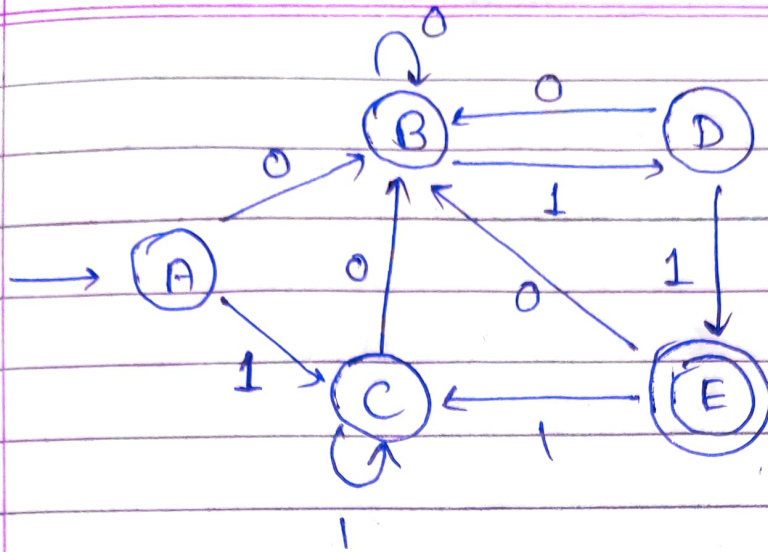
3 - Equivalence : { A } { D, E } { B, C } { G }

	0	1
{A}	{B, C}	{B, C}
{D, E}	{G}	{G}
{B, C}	{D, E}	{D, E}
{G}	{G}	{G}



Minimized DFA.

③



Myhill Nerode Theorem:

	A	B	C	D	E
A					
B	✓				
C		✓			
D	✓	✓	✓		
E	✓	✓	✓	✓	

$$\begin{aligned}
 (B, A) - \delta(B, 1) = D & \quad \delta(B, 0) = B \\
 - \delta(A, 1) = C & \quad \delta(A, 0) = B
 \end{aligned}
 \}$$

$$\begin{aligned}
 (C, A) - \delta(C, 0) = B & \quad \delta(C, 1) = C \\
 \delta(A, 0) = B & \quad \delta(A, 1) = C
 \end{aligned}
 \}$$

$$\begin{aligned}
 (D, C) - \delta(D, 0) = B & \quad \delta(D, 1) = E \\
 \delta(C, 0) = B & \quad \delta(C, 1) = C
 \end{aligned}
 \}$$

$$(C; B) - \left. \begin{array}{l} \delta(C, 0) = B \\ \delta(B, 0) = B \end{array} \right\} \left. \begin{array}{l} \delta(C, 1) = C \\ \delta(B, 1) = D \end{array} \right\}$$

$$(D, A) - \left. \begin{array}{l} \delta(D, 0) = B \\ \delta(A, 0) = B \end{array} \right\} \left. \begin{array}{l} \delta(D, 1) = E \\ \delta(A, 1) = C \end{array} \right\}$$

$$(D, B) - \left. \begin{array}{l} \delta(D, 0) = B \\ \delta(B, 0) = B \end{array} \right\} \left. \begin{array}{l} \delta(D, 1) = E \\ \delta(B, 1) = D \end{array} \right\}$$

$$(B, A) - \left. \begin{array}{l} \delta(B, 0) = B \\ \delta(A, 0) = B \end{array} \right\} \left. \begin{array}{l} \delta(B, 1) = D \\ \delta(A, 1) = C \end{array} \right\}$$

$$(C, A) - \left. \begin{array}{l} \delta(C, 0) = B \\ \delta(A, 0) = B \end{array} \right\} \left. \begin{array}{l} \delta(C, 1) = C \\ \delta(A, 1) = C \end{array} \right\}$$

$$(C; B) - \left. \begin{array}{l} \delta(C, 0) = B \\ \delta(B, 0) = B \end{array} \right\} \left. \begin{array}{l} \delta(C, 1) = C \\ \delta(B, 1) = D \end{array} \right\}$$

$$(C, A) - \left. \begin{array}{l} \delta(C, 0) = B \\ \delta(A, 0) = B \end{array} \right\} \left. \begin{array}{l} \delta(C, 1) = C \\ \delta(A, 1) = C \end{array} \right\}$$

Minimized DFA:

