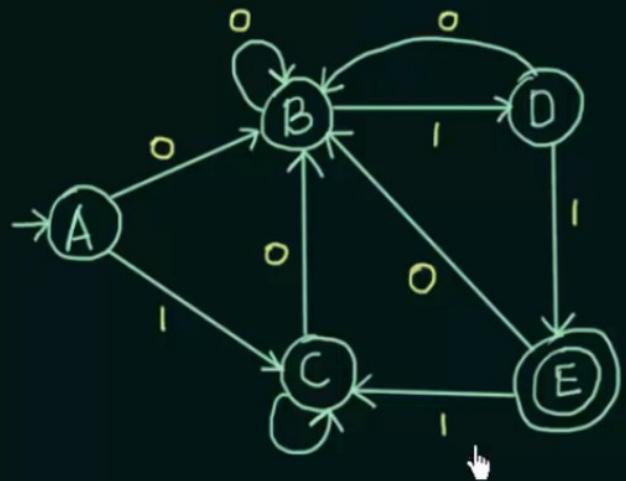
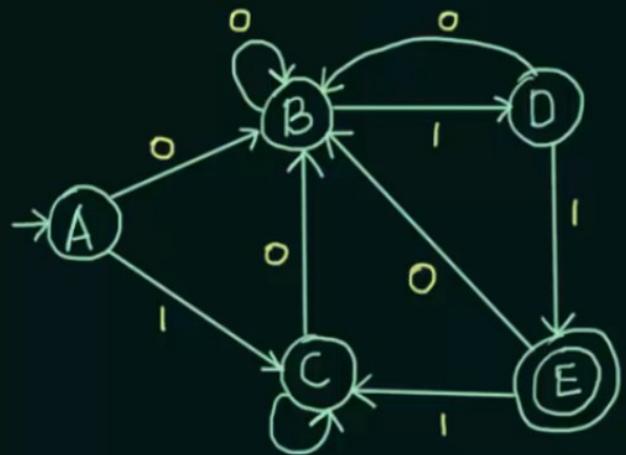


DFA Minimization-1

Minimization of DFA - Examples (Part-1)



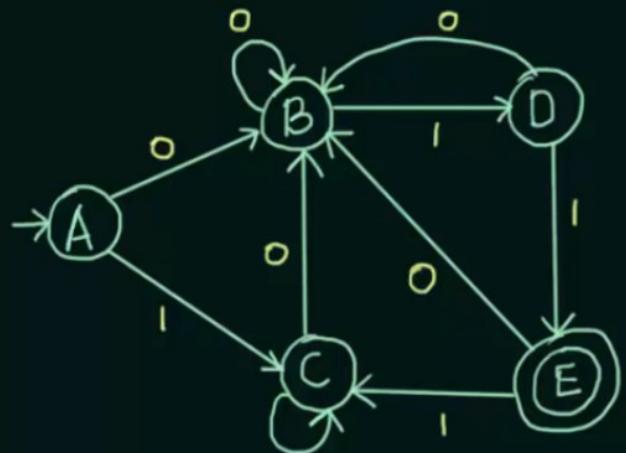
Minimization of DFA - Examples (Part-1)



	0	1
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C



Minimization of DFA - Examples (Part-1)

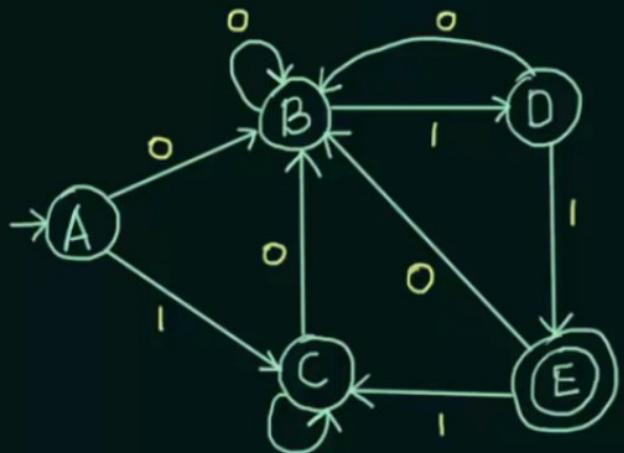


	0	1
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C

Equivalence : $\{A, B, C, D\}$ $\{E\}$



Minimization of DFA - Examples (Part-1)



	0	1
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C

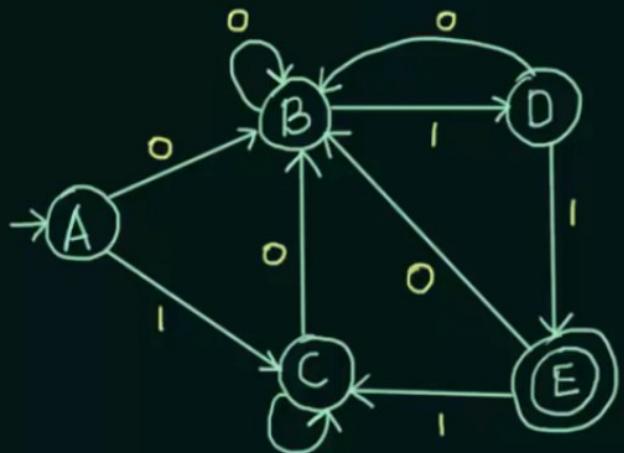
0 Equivalence : {A, B, C, D} {E}

1 Equivalence :

A, B



Minimization of DFA - Examples (Part-1)



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

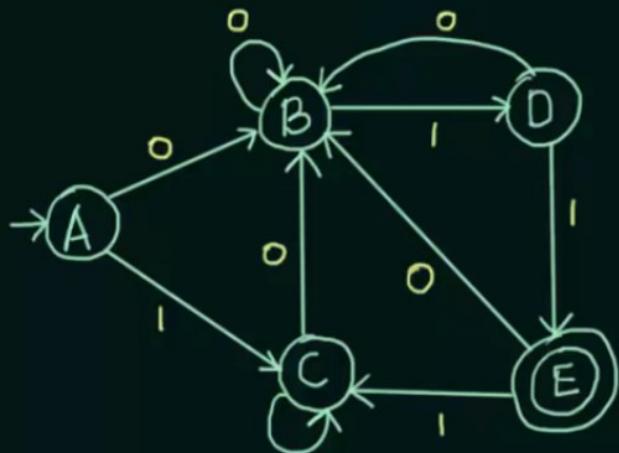
0 Equivalence : $\{A, B, C, D\}$ $\{E\}$

1 Equivalence : $\{A, B\}$ ↴

A, B ✓
A, C ✓



Minimization of DFA - Examples (Part-1)



	0	1
→ A	B	C
B	B	D
C	B	C
D	B	E
⊕	B	C

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

1 Equivalence : $\{A, B, C\}$

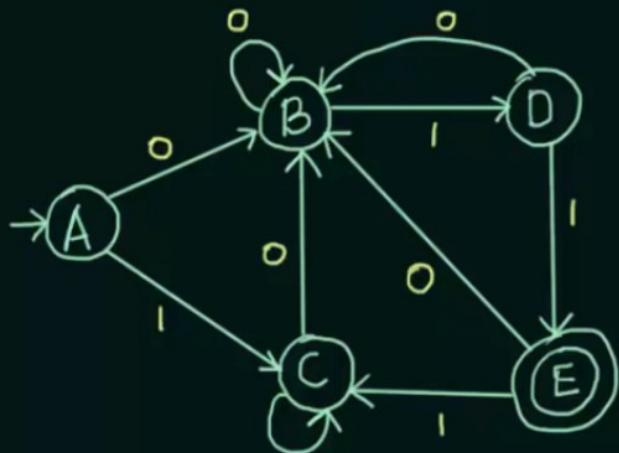
A, B ✓

A, C ✓

C, D ✗



Minimization of DFA - Examples (Part-1)



	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 : $\{A, B, C\}$ $\{D\}$ $\{E\}$



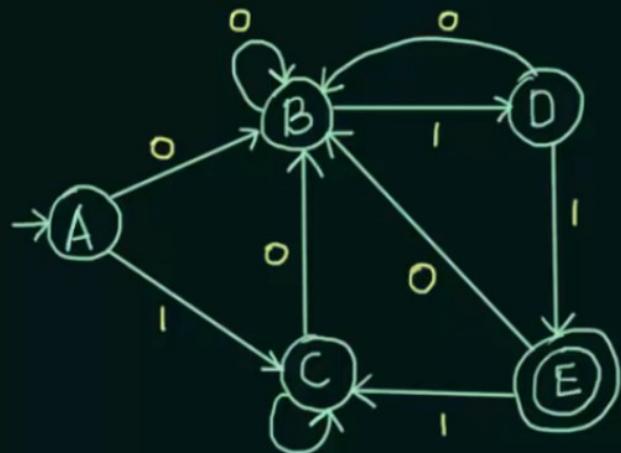
A, B ✓

A, C ✓

C, D ✗



Minimization of DFA - Examples (Part-1)



	0	1
→ A	B	C
B	B	D
C	B	C
D	B	E
⊕	B	C

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

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

2 Equivalence :

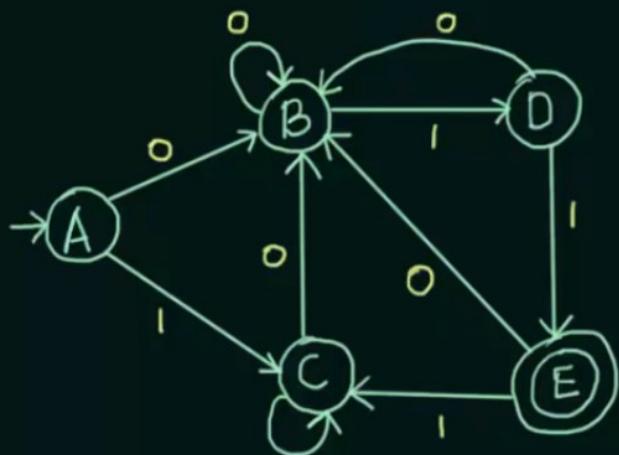
A, B ✓

A, C ✓

C, D ✗



Minimization of DFA - Examples (Part-1)



	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 :

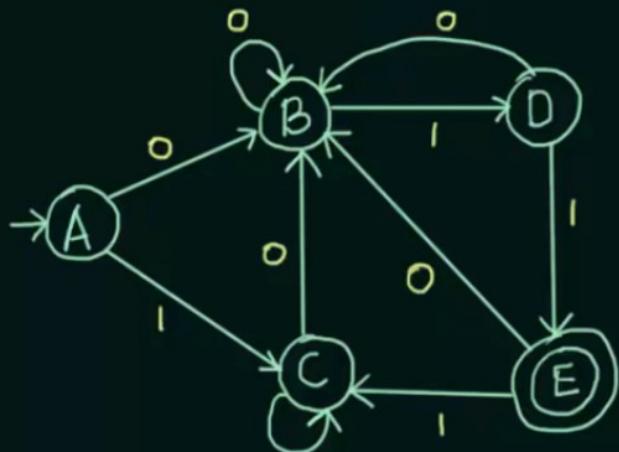
A, B ✓

A, C ✓

C, D ✗



Minimization of DFA - Examples (Part-1)



	0	1
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C

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

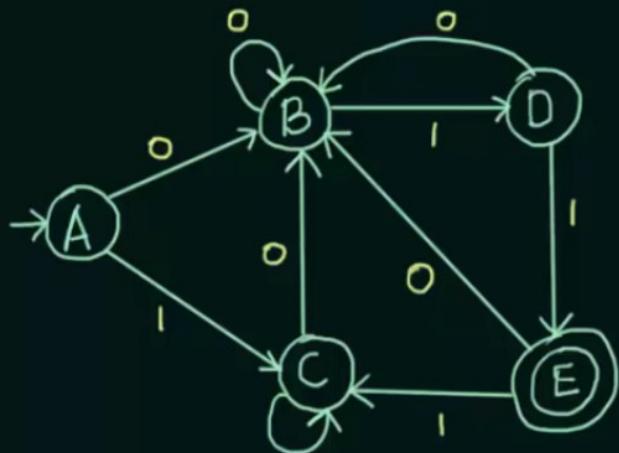
1 Equivalence : $\{A, B, C\}$ $\{D\}$ $\{E\}$

2 Equivalence : $\{A\}$ $\{B$

A, B ✓
A, C ✓
C, D ✗



Minimization of DFA - Examples (Part-1)



	0	1
→ A	B	C
B	B	D
C	B	C

B and C are not 2 equivalent to each other

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

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

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

A, B ✓

A, C ✓

C, D ✗



Minimization of DFA - Examples (Part-1)



	0	1
→ A	B	C
B	B	D
C	B	C

B and C are not 2 equivalent to each other

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

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

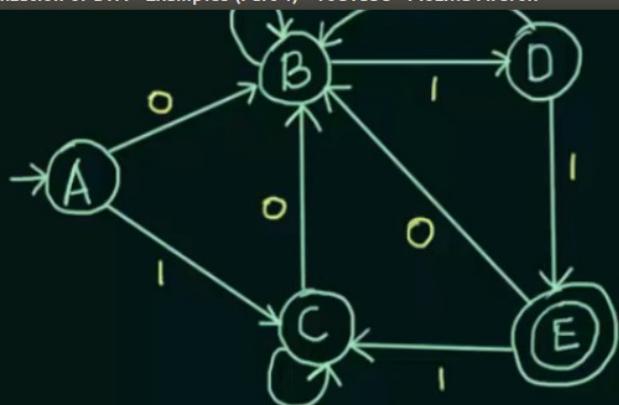
2 Equivalence : $\{A, C\}$ $\{B\}$ $\{D\}$ ✎

A, B ✓

A, C ✓

C, D ✗





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

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

A, B ✓

A, C ✓

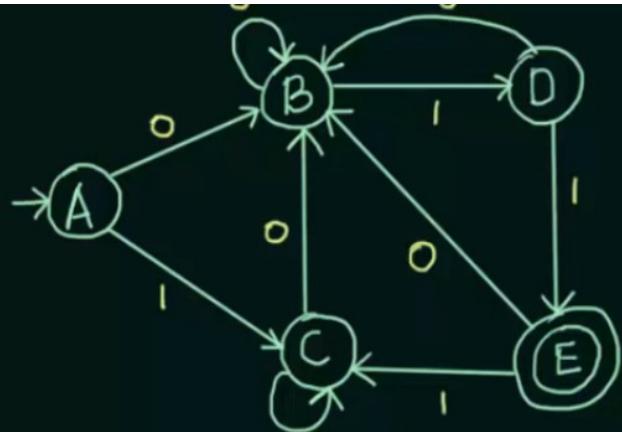
C, D ✗

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

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

3 Equivalence : $\{A, C\}$ $\{B\}$ $\{D\}$ $\{E\}$





	O	I
$\rightarrow A$	B	C
B	B	D
C	B	C
D	B	E
(E)	B	C

O Equivalence : $\{A, B, C, D\}$ $\{E\}$

A, B ✓

A, C ✓

C, D ✗

I Equivalence : $\{A, B, C\}$ $\{D\}$ $\{E\}$

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

3 Equivalence : $\{A, C\}$ $\{B\}$ $\{D\}$ $\{E\}$



0 Equivalence	$\{A, B, C, D\}$	$\{E\}$	A, B ✓		
1 Equivalence	$\{A, B, C\}$	$\{D\}$	$\{E\}$	A, C ✓	
2 Equivalence	$\{A, C\}$	$\{B\}$	$\{D\}$	$\{E\}$	C, D ✗
3 Equivalence	$\{A, C\}$	$\{B\}$	$\{D\}$	$\{E\}$	



	0	1
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C



0 Equivalence : $\{A, B, C, D\} \quad \{E\}$

A, B ✓

1 Equivalence : $\{A, B, C\} \quad \{D\} \quad \{E\}$

A, C ✓

2 Equivalence : $\{A, C\} \quad \{B\} \quad \{D\} \quad \{E\}$

C, D ✗

3 Equivalence : $\{A, C\} \quad \{B\} \quad \{D\} \quad \{E\}$



→ AC

(B)

(D)

(E)

	0	1
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C



0 Equivalence : $\{A, B, C, D\} \quad \{E\}$

A, B ✓

A, C ✓

C, D ✗

1 Equivalence : $\{A, B, C\} \quad \{D\} \quad \{E\}$

2 Equivalence : $\{A, C\} \quad \{B\} \quad \{D\} \quad \{E\}$

3 Equivalence : $\{A, C\} \quad \{B\} \quad \{D\} \quad \{E\}$



	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 : $\{A, C\}$ $\{B\}$ $\{D\}$ $\{E\}$

A, B ✓
A, C ✓
C, D ✗



	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 : $\{A, C\}$ $\{B\}$ $\{D\}$ $\{E\}$

$A, B \checkmark$
 $A, C \checkmark$
 $C, D \times$

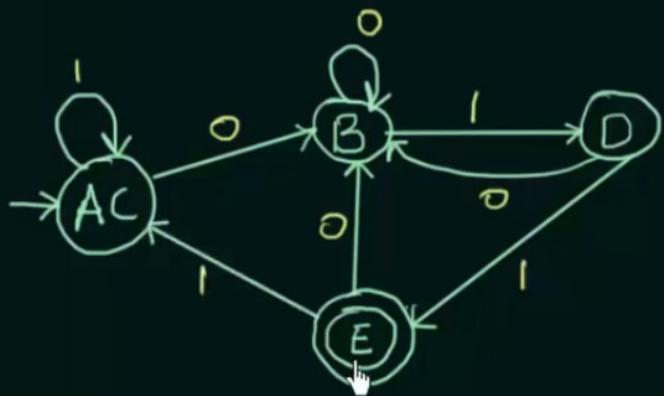


	O	I
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C



- 0 Equivalence : $\{A, B, C, D\}$ $\{E\}$
- 1 Equivalence : $\{A, B, C\}$ $\{D\}$ $\{E\}$
- 2 Equivalence : $\{A, C\}$ $\{B\}$ $\{D\}$ $\{E\}$
- 3 Equivalence : $\{A, C\}$ $\{B\}$ $\{D\}$ $\{E\}$

$A, B \checkmark$
 $A, C \checkmark$
 $C, D \times$



	0	1
A	B	C
B	B	D
C	B	C
D	B	E
E	B	C



- Questions???