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The obtained table consists of a single row. So, the machine is definite. Its order is the number of steps required to obtain the single state machine, and here it is 4.

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Finite State Machine | **205**

The obtained table consists of a single row. So, the machine is definite. Its order is the number of steps required to obtain the single state machine, and here it is 4.

16. Test whether the following machine is information lossless or not. If lossless, find its order.

The obtained table consists of a single row. So, the machine is definite. Its order is the number of steps required to obtain the single state machine, and here it is 4.

16. Test whether the following machine is information lossless or not. If lossless, find its order.

	Next State,Z	
Present State	X=0	X=1
A	B,1	A,1
B	D,0	B,0
C	D,0	B,1
D	E,1	C,1
E	A,1	B,0

Solution: The first step to test whether a machine is lossless or not is to construct a testing table. The testing table is divided into two halves.

Solution: The first step to test whether a machine is lossless or not is to construct a testing table. The testing table is divided into two halves.

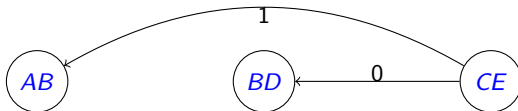|	Next State	
Present State	$z = 0$	$z = 1$
A	–	(AB)
B	(BD)	–
C	D	B
D	–	(CE)
E	B	A
(AB)	–	–
(BD)	–	–
(CE)	(BD)	(AB)

The testing table does not contain any repeated entry. The machine is an information lossless machine.

The testing graph for the machine is

The testing table does not contain any repeated entry. The machine is an information lossless machine.
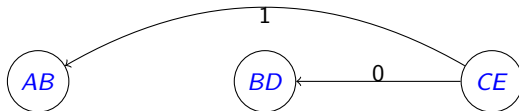
The testing graph for the machine is

The testing table does not contain any repeated entry. The machine is an information lossless machine.

The testing graph for the machine is

The testing graph for information losslessness is loop-free. The order of losslessness is $\mu = 1 + 2 = 3$. The length of the longest path of the graph is 1.

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17. Test whether the following machine is information lossless or not. If
lossless, find its order.

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17. Test whether the following machine is information lossless or not. If
lossless, find its order.

| | Next State,O/P | |
Present State	X=0	X=1
A	B,1	C,1
B	D,0	E,0
C	A,1	F,1
D	C,0	B,0
E	F,1	A,0
F	E,0	D,0

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17. Test whether the following machine is information lossless or not. If
lossless, find its order.

| | Next State,O/P | |
Present State	X=0	X=1
A	B,1	C,1
B	D,0	E,0
C	A,1	F,1
D	C,0	B,0
E	F,1	A,0
F	E,0	D,0

Solution: First, we have to construct a testing table for information losslessness for
testing whether the machine is information lossless or not. The testing table is divided
into two halves.

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Solution: First, we have to construct a testing table for information losslessness for testing whether the machine is information lossless or not. The testing table is divided into two halves.

	Next State	
Present State	$z = 0$	$z = 1$
A	–	BC
B	DE	–
C	–	AF
D	BC	–
E	–	AF
F	DE	–
AF	–	–
BC	–	–
DE	–	–

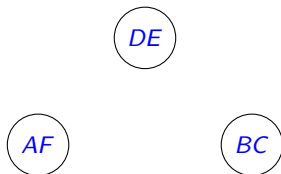The testing table does not contain any repeated entry. The machine is an information lossless machine.

The testing graph for the machine is
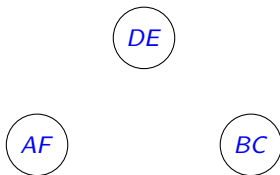
The testing table does not contain any repeated entry. The machine is an information lossless machine.

The testing graph for the machine is

The testing graph for information losslessness is loop-free. The order of losslessness is $\mu = 0 + 2 = 2$. The length of the longest path of the graph is 0.

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18. Test whether the following machine is information lossless or not. If lossless, fi nd its order.

18. Test whether the following machine is information lossless or not. If lossless, fi nd its order.

	Next State,O/P	
Present State	X=0	X=1
A	B,0	E,0
B	E,0	D,0
C	D,1	A,1
D	C,1	E,0
E	B,0	D,0

Solution: First, we have to construct a testing table for information losslessness for testing whether the machine is information lossless or not. The testing table is divided into two halves.

Solution: First, we have to construct a testing table for information losslessness for testing whether the machine is information lossless or not. The testing table is divided into two halves.

	Next State	
Present State	$z = 0$	$z = 1$
A	BE	—
B	DE	—
C	A	D
D	E	C
E	BD	—
BD	(DE)(EE)	-–
BE	(BD)(DE)	—
DE	(BE)(DE)	—

Solution: First, we have to construct a testing table for information losslessness for testing whether the machine is information lossless or not. The testing table is divided into two halves.

	Next State	
Present State	z = 0	z = 1
A	BE	—
B	DE	—
C	A	D
D	E	C
E	BD	—
BD	(DE)(EE)	-–
BE	(BD)(DE)	—
DE	(BE)(DE)	—

The testing table contains repeated entry (EE). Therefore, the machine is a lossy machine.

19. Test whether the following machine is information lossless or not. If lossless, find its order.

19. Test whether the following machine is information lossless or not. If lossless, find its order.

| | Next State,O/P | |
Present State	X = 0	X = 1
A	B, 1	C, 0
B	B, 1	D, 1
C	E, 1	B, 0
D	A, 0	E, 0
E	F, 0	D, 1
F	A, 1	D, 0

19. Test whether the following machine is information lossless or not. If lossless, find its order.

| | Next State,O/P | |
Present State	X = 0	X = 1
A	B, 1	C, 0
B	B, 1	D, 1
C	E, 1	B, 0
D	A, 0	E, 0
E	F, 0	D, 1
F	A, 1	D, 0

Solution: First, we have to construct a testing table for information losslessness for testing whether the machine is information lossless or not. The testing table is divided into two halves.

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	Next State	
Present State	$z = 0$	$z = 1$
A	C	B
B	-–	(BD)
C	B	E
D	(AE)	-–
E	F	D
F	D	A
AE	CF	BD
BD	-–	-–
CF	BD	AE

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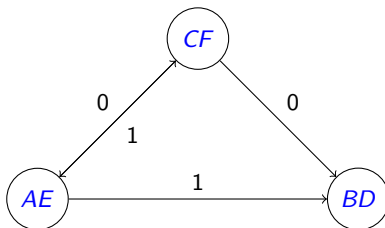|	Next State	
Present State	$z = 0$	$z = 1$
A	C	B
B	-–	(BD)
C	B	E
D	(AE)	-–
E	F	D
F	D	A
AE	CF	BD
BD	-–	-–
CF	BD	AE

The testing table does not contain any repeated entry. The machine is an
information lossless machine.

The testing graph for the machine is

The testing graph for the machine is
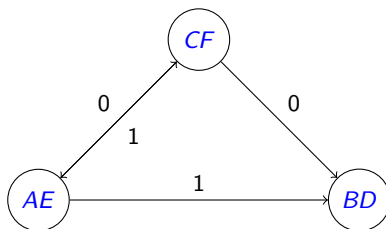
The testing graph for the machine is

The testing graph contains a loop. So, the machine is not information lossless of finite order. The order of losslessness $\mu = 2 + 2 = 4$. The length of the longest path of the graph is 2.

20. The state table of a finite state machine M is as follows. Check whether
the machine M is information lossless. If it is information lossless, then
determine the order of losslessness.

[WBUT 2003]

20. The state table of a finite state machine M is as follows. Check whether
the machine M is information lossless. If it is information lossless, then
determine the order of losslessness.

[WBUT 2003]

	Next State,O/P	
Present State	X = 0	X = 1
A	A, 0	B, 0
B	C, 0	D, 0
C	D, 1	C, 1
D	B, 1	A, 0

20. The state table of a finite state machine M is as follows. Check whether the machine M is information lossless. If it is information lossless, then determine the order of losslessness.

[WBUT 2003]

| | Next State,O/P | |
Present State	X = 0	X = 1
A	A, 0	B, 0
B	C, 0	D, 0
C	D, 1	C, 1
D	B, 1	A, 0

Solution: First, we have to construct a testing table for information losslessness for testing whether the machine is information lossless or not. The testing table is