LIFT MECHANISM

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1 flip flops and its truth table

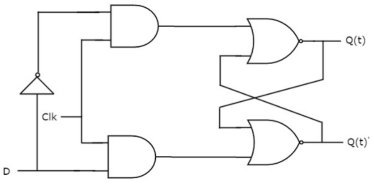

Figure 1: circuit diagram of d flip flop

CHARACTARISTICSTABLEOFDFLIPFLOP

Q Output		Input
$Q_{(n)}$	$Q_{(n+1)}$	D_n
0	0	0
0	1	1
1	0	0
1	1	1

2 purpose of circuit

In the lift mechanism we are going to introduce a simulation in which the input line will be: X0,X1. the traversal will occur among 2 bit binary number, in simple language we can say that the lift travels in 4 floor building including ground floor.

3 state table formation

since for every input value of X0 and X1 the traversal differs, so we will be forming state table for each table separately for clarification.

$$X0 = 0, X1 = 0$$

An	Bn	A(n+1)	B(n+1)	DA	DB
0	0	0	0	0	0
0	1	0	0	0	0
1	0	0	1	0	1
1	1	1	0	1	0

$$X0 = 0, X1 = 1$$

An	Bn	A(n+1)	B(n+1)	DA	DB
0	0	0	1	0	1
0	1	0	1	0	1
1	0	0	1	0	1
1	1	1	0	1	0

$$X0 = 1, X1 = 0$$

An	Bn	A(n+1)	B(n+1)	DA	DB
0	0	0	1	0	1
0	1	1	0	1	0
1	0	1	0	1	0
1	1	1	0	1	0

$$X0 = 1, X1 = 1$$

An	Bn	A(n+1)	B(n+1)	DA	DB
0	0	0	1	0	1
0	1	1	0	1	0
1	0	1	1	1	1
1	1	1	1	1	1

4 K-map formation

$$X0 = 0, X1 = 0$$

DA	B'	B
A'	0	0
A	0	1

DB	B'	B
A'	0	0
A	1	0

$$X0 = 0, X1 = 1$$

DA	B'	B
A'	0	0
A	0	1

DB	B'	B
A'	1	1
A	1	0

$$X0 = 1, X1 = 0$$

DA	B'	B
A'	0	1
A	1	1

DB	B'	B
A'	1	1
A	1	0

$$X0 = 1, X1 = 1$$

DA	B'	B
A'	0	1
A	1	1

DB	B'	B
A'	1	0
A	1	1

5 expressions for DA and DB

from the above k-maps we can introduce the expressions for the d terminal flip flops

$$DA = X0'X1'AB + X0'X1AB + X0X1'(A + B) + X0X1(A + B)$$

$$DB = X0'X1'AB' + X0'X1(A' + B') + X0X1'(A' + B') + X0X1(A + B')$$

DA	X0'X1'	X0'X1	X0X1	X0X1'
A'B'	0	0	0	0
A'B	0	0	1	1
AB	1	1	1	1
AB'	0	0	1	1

DB	X0'X1'	X0'X1	X0X1	X0X1'
A'B'	0	1	1	1
A'B	0	1	0	1
AB	0	0	1	0
AB'	1	1	1	1

$$DA = X0(A + B) + AB$$

$$DB = AB' + X0X1A + X1B' + X0X1'A' + X0'X1A'$$