University Of Engineering And Technology Taxila

Digital Logic Design

Lab Project Report

Topic:

sequence detector to detects 0110 using JK flip flop

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ABSTRACT:

We had compile a project on sequence detector that detects 0110. We can make this detector using D flip flop and T flip flop as well but here we are obliged to use JK flip flop only. We had solved this by using strategy of designing any sequential circuit.

THEORETICAL BACKGROUND:

A **sequence detector** is a sequential state machine which takes an input string of bits and generates an output 1 whenever the target sequence has been detected. In a Mealy machine, output depends on the present state and the external input (x). Hence in the diagram, the output is written outside the states, along with inputs.

Sequence detector is of two types:

1. Overlapping
2. Non-Overlapping

In an overlapping sequence detector the last bit of one sequence becomes the first bit of next sequence.

However, in non-overlapping sequence detector the last bit of one sequence does not become the first bit of next sequence.In this post, we'll discuss the design procedure for non-overlapping 101 Mealy sequence detector.

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Examples:

For non overlapping case

Input :0110101011001

Output:0000100010000

For overlapping case

Input :0110101011001

Output:0000101010000

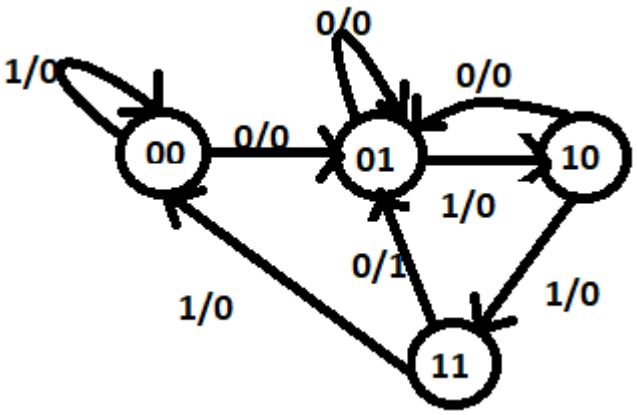
To design any sequential circuit following steps are followed:

1. Develop the state diagram
2. Make Present State/Next State table –
3. Draw K-maps for Ja,Ka,Jb,Kb and output (y) –
4. Finally implement the circuit –

PROCEDURE:

THEORETICAL IMPLEMENTATION:

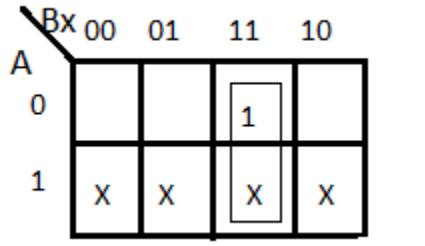
STEP 1: STATE DIAGRAM



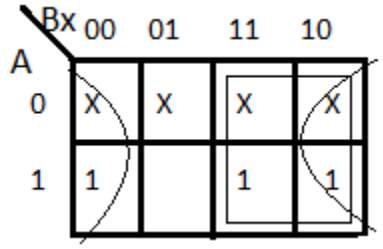
STEP 2: STATE TABLE:

PRESENT STATE		I/P	O/P	NEXT STATE		FLIP FLOP INPUTS			
A	B	X	Y	A(T+1)	B(T+1)	Ja	Ka	Jb	Kb
0	0	0	0	0	1	0	X	1	X
0	0	1	0	0	0	0	X	0	X
0	1	0	0	0	1	0	X	X	0
0	1	1	0	1	0	1	X	X	1
1	0	0	0	0	1	X	1	1	X
1	0	1	0	1	1	X	0	1	X
1	1	0	1	0	1	X	1	X	0
1	1	1	0	0	0	X	1	X	0

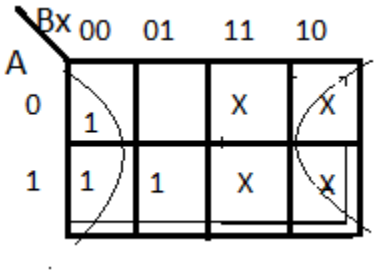
STEP 3: STATE EQUATIONS:



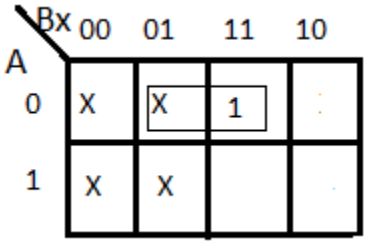
Ja=Bx



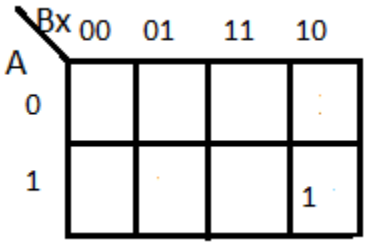
Ka=x'+B



Jb=A+x'

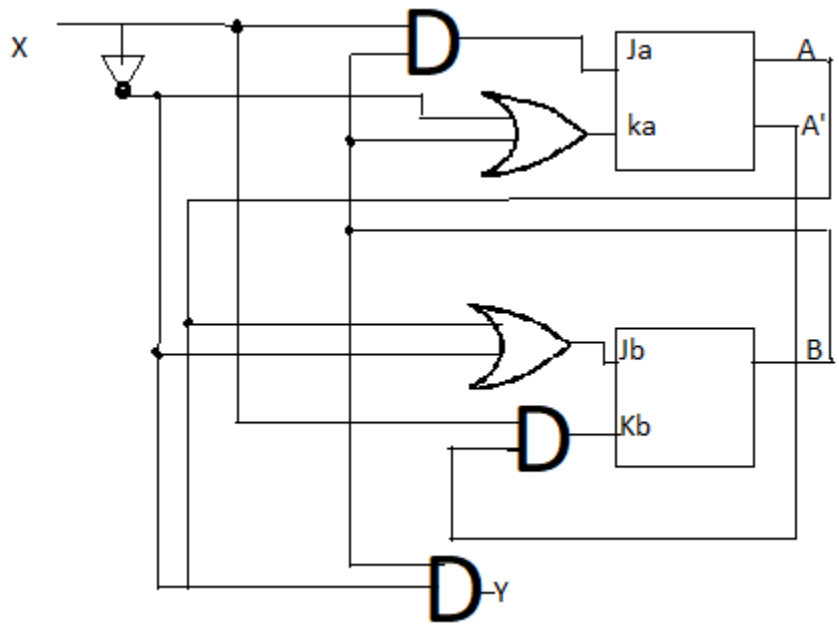


Kb=A'x



Y=ABx'

STEP 4:LOGIC DIAGRAM:



Step5: CODE

Conclusion:

From this project it is conclude that we

References:

1- https://www.youtube.com/watch?v=bdZ4dayl5mc

2- https://www.geeksforgeeks.org/