IMPLEMENTATION OF SEQUENCE DETECTOR USING LED IN ARDUINO

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CONTENTS

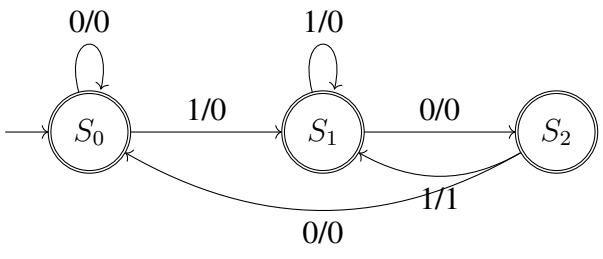
I. QUESTION

A sequence detector is designed to detect precisely 3 digital inputs, with overlapping sequence detectable. For the sequence $(1, 0, 1)$ and input data $(1, 1, 0, 1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 0)$

1) 1,1,0,0,0,0,1,1,0,1,0,0
2) 0,1,0,0,0,0,0,1,0,1,0,0
3) 0,1,0,0,0,0,0,1,0,1,1,0
4) 0,1,0,0,0,0,0,1,0,1,0,0

II. ANSWER

The above question can be solved by using State diagram, Truth Table and karnaugh-map.



A. Truth Table

p	q	x	$\bar{p}$	$\bar{q}$	y	$D1$	$D2$
0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	1
0	1	0	1	0	0	1	0
0	1	1	0	1	0	0	1
1	0	0	0	0	0	0	0
1	0	1	0	1	1	0	1
1	1	0	x	x	x	x	x
1	1	1	x	x	x	x	x

Truth table for Boolean function

B. K-Map Implementation of y

p \ qx	00	01	11	10
0	0	0	0	0
1	0	1	X	X

Table. 1

herefore, the Boolean function is $y = px$.

C. K-Map Implementation of $D1$

p \ qx	00	01	11	10
0	0	0	0	1
1	0	0	X	X

Table. 2

Therefore, the Boolean function is $D1 = q\bar{x}$.

D. K-Map Implementation of $D2$

p \ qx	00	01	11	10
0	0	1	1	0
1	0	1	X	X

Table. 3

Therefore, the Boolean function is $D2 = x$.

III. Components

Components	Values	Quantity
Arduino	Uno	1
Jumper Wires	M-M	7
Breadboard		1
LED		2
Resistor	220 ohms	2

IV. Implementation

Arduino PIN	INPUT	OUTPUT
2	manual	
3		LED
13		LED

Procedure

1. Connect the circuit as per the above table.
2. Upload the code for arduino from the below link.

   https://github.com/pavannagasuryach/cbse-12th-optimization/tree/main

3. Change the values of **Inputs** in the Hardware and verify the sequence.