MULTIPLE SEQUENCE DETECTOR 1100 and 0100

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CONTENTS

***Abstract*—This manual explains state machines by identify the sequence that detect 1100 and 0100**

I. COMPONENTS

Components	Value	Quantity
Resistor	220 Ohm	1
Arduino	UNO	1
Seven Segment Display		1
Decoder	7447	1
Flip Flop	7474	2
Bread Board		1
Jumper Wires		20

II. SEQUENCE DETECTOR

A sequence detector accepts as input a string of bits: either 0 or 1. Its output goes to 1 when a target sequence has been detected.There are two basic types: overlap and non-overlap. In a sequence detector that allows overlap, the final bits of one sequence can be the start of another sequence. Our examples 1100 and 0100 sequence detector. It raises an output of 1 when the last 4 binary bits received 1100 or 0100.

A. *STATE DIAGRAM*

State diagrams are used to give an abstract description of the behavior of a system. This behavior is represented as a series of events that can occur in one or more possible states.State diagram is represented in Figure 1

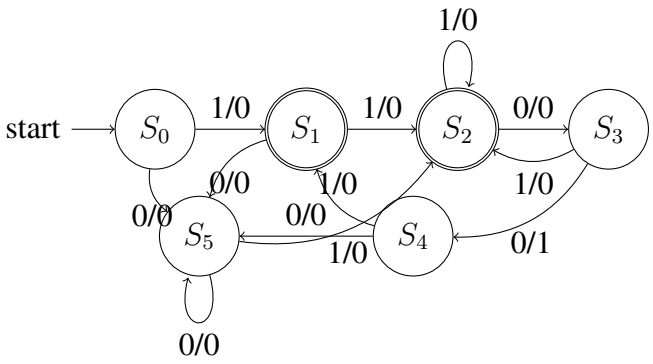

Figure 1: State Diagram for Sequence

B. *STATE TABLE*

From state diagram,state table can be generated in Table II.

Present State	Input	Next state	Output
S0	0	S5	0
S0	1	S1	0
S1	0	S5	0
S1	1	S2	0
S2	0	S3	0
S2	1	S2	0
S3	0	S4	1
S3	1	S4	0
S4	0	S5	0
S4	1	S1	0
S5	0	S5	0
S5	1	S2	0

Table I: .STATE TABLE

C. *TRUTH TABLE*

Present State	Input	Next state	Output
A B C	X	P Q R	Y
0 0 0	0	1 0 1	0
0 0 0	1	0 0 1	0
0 0 1	0	1 0 1	0
0 0 1	1	0 1 0	0
0 1 0	0	0 1 1	0
0 1 0	1	0 1 0	0
0 1 1	0	1 0 0	1
0 1 1	1	0 1 0	0
1 0 0	0	1 0 1	0
1 0 0	1	0 0 1	0
1 0 1	0	1 0 1	0
1 0 1	0	0 1 0	0

Table II: .TRUTH TABLE

D. *Karnaugh Map*

AB \ CX	00	01	11	10
00	1	0	0	1
01	0	0	0	1
11	X	X	X	X
10	1	0	0	1

$$P = B'X' + CX' \quad (1)$$

AB \ CX	00	01	11	10
00	0	0	1	0
01	1	1	1	0
11	X	X	X	X
10	0	0	1	0

$$Q = CX + BX' \quad (2)$$

AB \ CX	00	01	11	10
00	1	1	0	1
01	1	0	0	0
11	X	X	X	X
10	1	1	0	1

$$R = B'X' + C'X' + B'C' \quad (3)$$

AB \ CX	00	01	11	10
00	0	0	0	0
01	0	0	0	1
11	X	X	X	X
10	0	0	0	0

$$Y = CX'B \quad (4)$$

4 PROCEDURE

1. Generate the CLOCK signal using the blink program.
2. Connect the Arduino, 7447 ,two 7474 ICs,LED and seven segment according to Table III.
3.Intelligently use the codes in https://github.com/Gangagopinath/ASSIGNMENT-1/blob/mai

	INPUT				OUTPUT						5V			
	A	B	C	X	P	Q	R	Y	CLOCK					
Arduino	4	3	2	10	6	7	8	9	13					
7474	5	9			2	12			CLK1	CLK2	1	4	10	13
7474			5				2		CLK1	CLK2	1	4	10	13
7447	7	1	2											
								LED						

Table III: Connection Table