# IMPLEMENTATION OF SEQUENCE DETECTOR USING LED IN IOT

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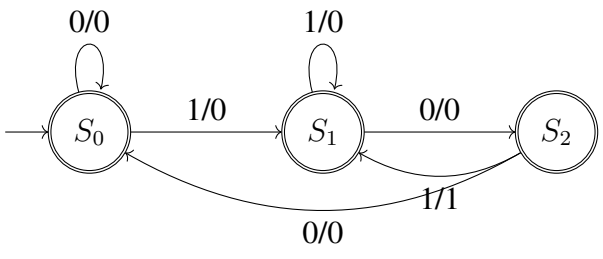
## I. QUESTION

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 |
|---|---|---|
| IOT | | 1 |
| Jumper Wires | M-M | 7 |
| Breadboard | | 1 |
| LED | | 2 |
| Resistor | 220 ohms | 2 |

## IV. Implementation

| Vaman PIN | INPUT | OUTPUT |
|---|---|---|
| 2 | manual | |
| 3 | | $LED$ |
| 13 | | $LED$ |

**Procedure**

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

   https://github.com/SrinathReddyMarri/FWC//blob/master/IOT/main.cpp

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