

Karnaugh-map Using Arduino

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Abstract

The objective of this manual is to show how to verify following min-terms.F = (m7+m2+m6+m5) using karnaugh-map

1 Introduction

Karnaugh-map provides a systematic method for simplifying boolean expressions and may produce simplest SOP or POS expressions.

karnaugh-map used to minimize number of logic gates that are required in a digital circuit.

2 components

component	value	quantity	
Arduino	UNO	1	
Breadboard	-	1	
Led	-	1	
Resistor	220ohm	1	
Jumperwires	M-M	10	

Table-0

3 karnaugh-map

3.1 Implementation

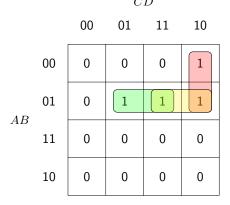


Figure 1:k-map

From the above karnaugh-map the expression is

A'BD+A'BC+CD'A'

This karnaugh-map is verified by using

Truthtable Table-1

4 Truthtable

Α	В	С	D	O/P	
0	0	0	0	0	
0	0	0	1	0	
0	0	1	0	1	
0	0	1	1	0	
0	1	0	0	0	
0	1	0	1	1	
0	1	1	0	1	
0	1	1	1	1	
1	0	0	0	0	
1	0	0	1	0	
1	0	1	0	0	
1	0	1	1	0	
1	1	0	0	0	
1	1	0	1	0	
1	1	1	0	0	
1	1	1	1	0	
	0 0 0 0 0 0 0 0 1 1 1 1 1	0 0 0 0 0 0 0 0 0 1 0 1 1 0 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 1 0 0 1 0 1 0 1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 1 0 0 1 0 0 0 1 1 0 1 0 0 0 1 1 0 0 1 1 1 1 0 0 0 1 0 0 1 1 0 1 0 1 0 1 1 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1	

Table-1

5 Hardware Connections

1.connect the arduino to the computer.

arduino	8	9	10	11	2	gnd
input	А	В	С	D		
led					+	-

2. The led will on and off when changing the inputs.

Table-2

6 Software

Download the follwing code

https://github.com/maddudinesh/iithyderabad-fwc/blob/main/assign1-assembly/codes/hello.asm