

# Karnaugh-map Using Arduino

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## Abstract

The objective of this manual is to show how to verify following min-terms. $F = (m_7 + m_2 + m_6 + m_5)$  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

		<i>CD</i>			
		00	01	11	10
<i>AB</i>	00	0	0	0	1
	01	0	1	1	1
	11	0	0	0	0
	10	0	0	0	0

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

	A	B	C	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

Table-1

## 5 Hardware Connections

1.connect the arduino to the computer.

arduino	8	9	10	11	2	gnd
input	A	B	C	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
```