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Project Based Learning:

Individual Project

# Project Overview:

I will create a traffic light circuit using a simple 2:4 decoder and a half-adder to cycle through binary number 0-3 which will activate green, yellow, and red led lights.

# Standards:

* Know how to use decoders and half-adders
* Must cycle through colors on it’s own after initial input
* Binary numbers would be used as the inputs

# Objectives:

* Create a 2:4 decoder that will give the appropriate output based on given input from half-adder
* The output to the 2:4 decoder will activate different color led representing each traffic light.
* Create K-Maps and Truth Tables
* Half adder input will be 1 and 0 represented by 5V or 0V

# Requirements/Task(s):

Create Logic Circuit

Create K-Maps

Create Truth Table

Create Boolean Expression

# Record your notes/research here:

# Truth Table for Half Adder

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | Carry | Sum |
| FALSE | FALSE | FALSE | FALSE |
| FALSE | TRUE | FALSE | TRUE |
| TRUE | FALSE | FALSE | TRUE |
| TRUE | TRUE | TRUE | FALSE |
|  |  |  |  |

# Truth Table For 2:4 Decoder

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| I1 | I2 | O1 | O2 | O3 | O4 |  |
| FALSE | FALSE | FALSE | FALSE | FALSE | TRUE |  |
| FALSE | TRUE | FALSE | TRUE | FALSE | FALSE |  |
| TRUE | FALSE | FALSE | TRUE | FALSE | FALSE |  |
| TRUE | TRUE | FALSE | FALSE | TRUE | FALSE |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Sum* |  |  | *B* | |  |
|  |  |  | *0* | *1* |  |
| *A* |  | *0* | 0 | 1 |  |
|  |  | *1* | 1 | 0 |  |

# K- Maps for sum

# NOTA\*B + A\*NOTB

|  |  |  |  |
| --- | --- | --- | --- |
| *Carry* |  | *B* | |
|  |  | *0* | *1* |
| *A* | *0* | 0 | 0 |
|  | *1* | 0 | 1 |

## K- Maps for Carry

## AB

## 

## Logic Circuit

## Teacher initials \_\_\_\_\_\_\_\_\_\_\_\_

### You are ready to create your project! Please revisit the project tasks/requirements as you work.

# Summarize what you learned:

Learned about logic circuits.

# Add the link to your project here:

Link to access project