3 to 8 Decoder through VAMAN ARM-GCC

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CONTENTS

***Abstract*—This document shows how to use VAMAN Board as a 3 to 8 Decoder**

I. COMPONENTS

Component	Value	Qunatity
Resistor	220Ohm	8
LED	Red	8
VAMAN Board		1
Jumper Wires	M-F	20
BreadBoard		1

TABLE I

II. HARDWARE

Problem 2.1 Make connections between the Vaman Board(PYGMY) and LED's as shown in Table 2

Problem 2.2 Connect anodes of LED's to the pins using resistors and cathodes to ground(gnd).

IO_4	IO_5	IO_6	IO_7	IO_8	IO_10	IO_11	IO_12
led1	led2	led3	led4	led5	led6	led7	led8

TABLE II

Problem 2.3 Connect the input pins X, Y, Z to Vaman as shown in Table 3.

X	Y	Z
IO_28	IO_29	IO_31

TABLE III

III. SOFTWARE

Problem 3.1 Execute the following script in termux which compiles the code and sends it to pi. **Note:** Change the ipaddress accordingly.

wget https://github.com/mygit-sampath-govardhan/fwc-iith-assignments/blob/14bf619b0f2efd421bb36bb4357cc751132bf78b/Assignment-9(ARM-3to8%20decoder)/script.sh

Problem 3.2 Now execute the following script in pi which flashes .bin file to Vaman board, and verify all the outputs as mentioned in Truth table (Table 4) by modifying the inputs X, Y, Z to 0's and 1's respectively.

wget https://github.com/mygit-sampath-govardhan/fwc-iith-assignments/blob/14bf619b0f2efd421bb36bb4357cc751132bf78b/Assignment-9(ARM-3to8%20decoder)/In%20pi/arm.sh

Note: Output pins IO_4-8,IO_10-12 are referenced as A-H respectively and input pins IO_28,29,31 are referred as X,Y,Z respectively.

X	Y	Z	A	B	C	D	E	F	G	H
0	0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	1	0
0	1	0	0	0	0	0	0	1	0	0
0	1	1	0	0	0	0	1	0	0	0
1	0	0	0	0	0	1	0	0	0	0
1	0	1	0	0	1	0	0	0	0	0
1	1	0	0	1	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0

TABLE IV
TRUTH TABLE

IV. Solution

In the Truth table (Table3) X,Y,Z are inputs and A,B,C,D,E,F,G,H are outputs. This table represents the system that behaves as a 3 to 8 decoder. Using Boolean logic,

A= X' Y' Z'

B= X' Y' Z

C= X' Y Z'

D= X' Y Z

E= X Y' Z'

F= X Y' Z

G= X Y Z'

H= X Y Z

V. Conclusion

A 3 to 8 decoder has 3 inputs and 8 outputs are generated using these 3 inputs.

Here 3 to 8 decoder with Vaman Board has been successfully verified.