Sarahanyan / **systemc-examples**
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Sarahanyan Creation of a 2by4 decoder using 1by2 decoders and andgates d494249 11 days ago

1 contributor

42 lines (34 sloc) 1.72 KB

This is a 2-by-4 decoder example, which is a makefile project and so no need for an IDE. Just cd into this folder and run the command

```
make decoder
```

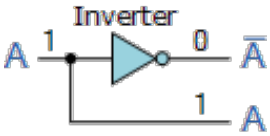
A line decoder is a device that changes the input code into a set of signals.
It takes an n-digit binary number and decodes it into 2^n data lines. It does the reverse of encoding.
In the following truth table, only the output D0 is high when the input is zero, and the output D1 is high when the input is 1. it decodes a single digit binary number.

A	D_1	D_0
0	0	1
1	1	0

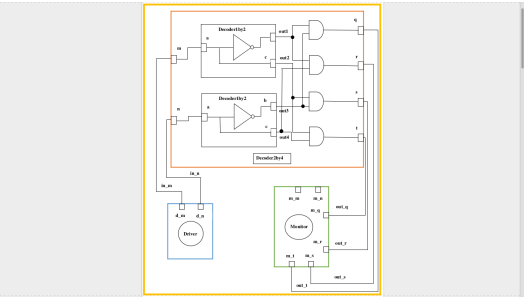
In the following truth table, only the output D0 is high when both the input is zero, and the output D1 is high when the input is 0 and 1, D2 is high when the input is 1 and 0 and D3 is high when both inputs are 1. it decodes a double digit binary number.
Only one signal is high(selected) when the right binary number is available on the input.
A two by four decoder truth table:

Inputs		Output			
A	B	D_0	D_1	D_2	D_3
0	0	1	0	0	0
0	1	0	1	0	0
0	1	0	0	1	0
1	1	0	0	0	1

Circuit:

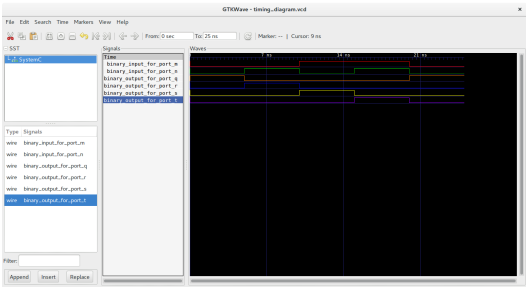


Model of computation:



Results:

The above MOC was implemented in systemc (code in this folder) and the following output found from traced signals.
Traced signals timing diagram:



Tutorial 1:

###Create a decoder_2by4 based on this decoder_1by2.
###Reuse the systemc module for decoder_1by2 cascaded to build a more complex module for the decoder_2by4. ###*Hint:* use additional and logic (AND) gates to determine the final outputs as in the truth table.