

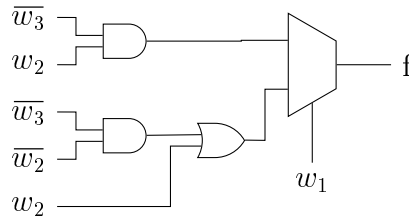
1. *Book Problems: 4.3, 4.21*

(4.3) Consider $f = \overline{w_1}\overline{w_3} + w_2\overline{w_3} + \overline{w_1}w_2$. Use the truth table to derive a circuit for f that uses a 2-to-1 multiplexer.

Note that the truth table for the above can be found as:

w_1	w_2	w_3	f
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

Which is equivalent to the below circuit, using w_1 as the select in a multiplexer.



(4.21) Write Verilog code for an 8-to-3 binary encoder.

```

module Encode (b, f);
    input [7:0] b;
    output reg [2:0] f;
    always@(*)
    begin
        case(b)
            8'b00000001: f = 3'b000;
            8'b00000010: f = 3'b001;
            8'b00000100: f = 3'b010;
            8'b00001000: f = 3'b011;
            8'b00010000: f = 3'b100;
            8'b00100000: f = 3'b101;
            8'b01000000: f = 3'b110;
            8'b10000000: f = 3'b111;
        endcase
    end
endmodule
    
```

2. Implement the following circuits using only 2-to-1 multiplexers.

(a) $f = \sum m(2, 5, 6, 14)$

Note that the truth table, and circuit derived from it, are as shown below:

a	b	c	d	f
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	0
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	1
1	1	1	1	0

Put a circuit here!

(b) $f = \prod M(3, 4, 5, 6, 7)$

Golly gee

3. *Convert the following decimal numbers to 32-bit floating point format.*

(a) *33554430*

Hey ho

(b) *33554431*

Let's go

4. *Convert the following decimal numbers to fixed point unsigned binary with at least 8-bits of binary precision*

(a) *12.45897*

What now

(b) *0.333333*

To much placeholdering

5. *For 32-bit Precision Floating point numbers, $E=0x00$ and $E=0xFF$ are used for special numbers (like 0 and ∞). What are the decimal values of the floating point numbers (32-bit) of smallest (non-zero) and largest (non-infinity) magnitude*