

Chapter 8

Standard Combinational Circuits

SKEE1223 Digital Electronics

Mun'im/Arif/Izam

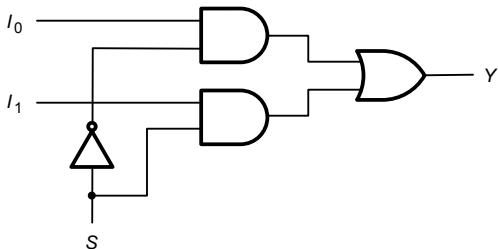
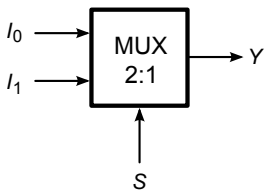
FKE, Universiti Teknologi Malaysia

October 30, 2015

Overview

- 1 Overview
- 2 MUX applications
- 3 MUX expansion
- 4 Demultiplexers

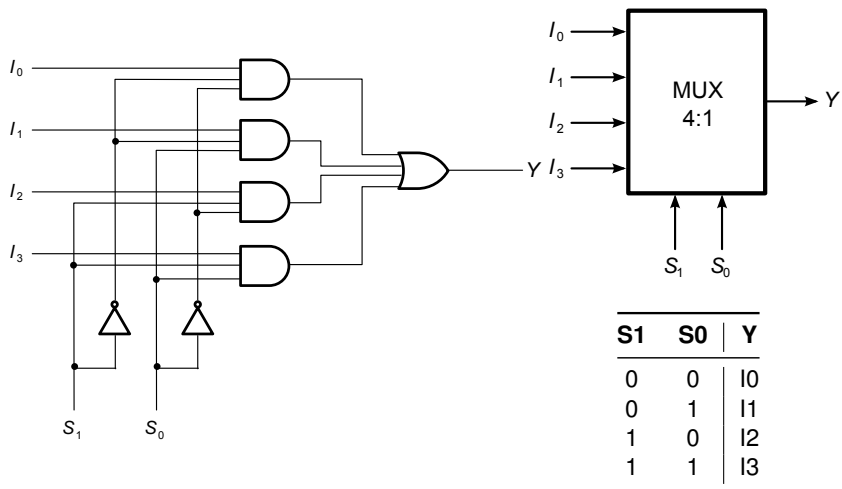
2-to-1 Multiplexer



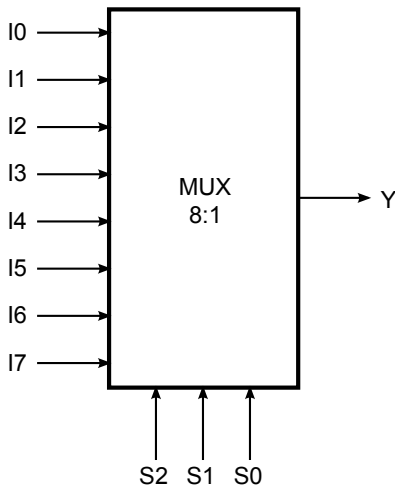
S	I_0	I_1	Y
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

S	Y
0	I_0
1	I_1

4-to-1 Multiplexer

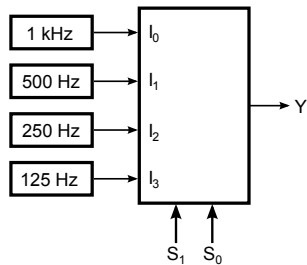
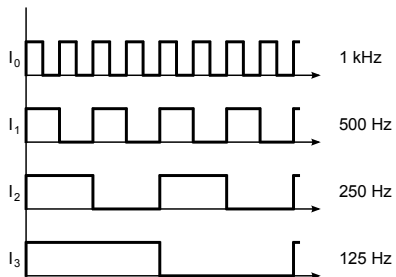


8-to-1 Multiplexer

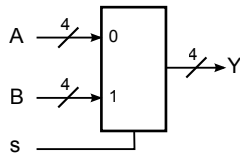
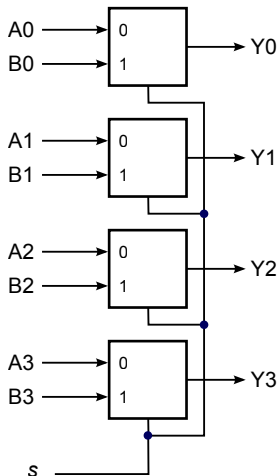


S2	S1	S0	Y
0	0	0	I0
0	0	1	I1
0	1	0	I2
0	1	1	I3
1	0	0	I4
1	0	1	I5
1	1	0	I6
1	1	1	I7

Waveform Selector

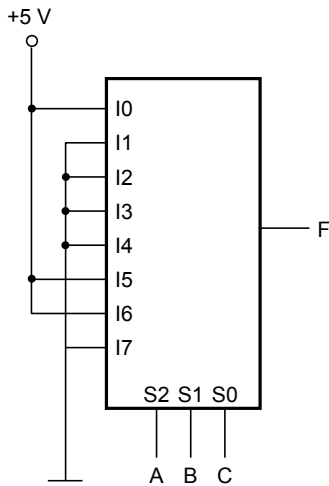


Bus Selector



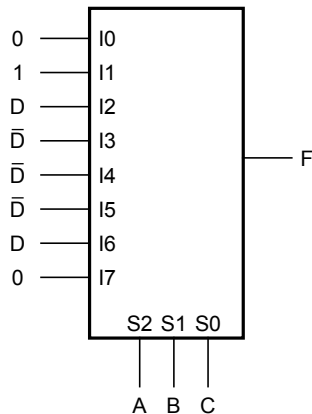
Rapid Implementation of Logic Functions

$$F(A, B, C) = \sum m(0, 5, 6)$$

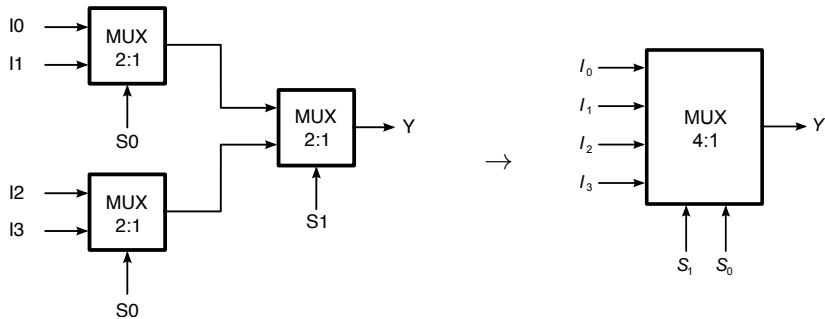


Rapid Implementation of Logic Functions

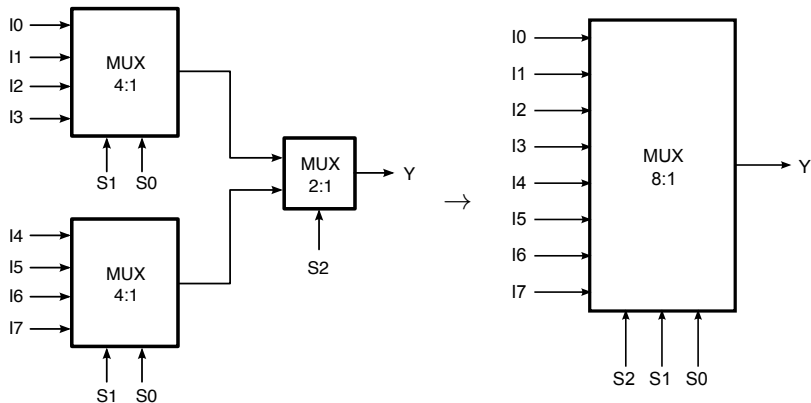
Inputs				Outputs	
A	B	C	D	F	Mux input
0	0	0	0	0	$F = 0$
0	0	0	1	0	
0	0	1	0	1	$F = 1$
0	0	1	1	1	
0	1	0	0	0	$F = D$
0	1	0	1	1	
0	1	1	0	1	$F = \bar{D}$
0	1	1	1	0	
1	0	0	0	1	$F = \bar{D}$
1	0	0	1	0	
1	0	1	0	1	$F = \bar{D}$
1	0	1	1	0	
1	1	0	0	0	$F = D$
1	1	0	1	1	
1	1	1	0	0	$F = 0$
1	1	1	1	0	



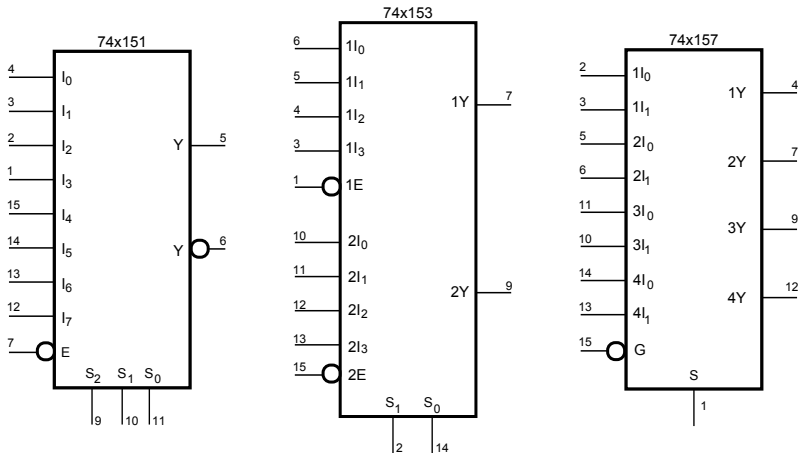
Implementing 4:1 MUX



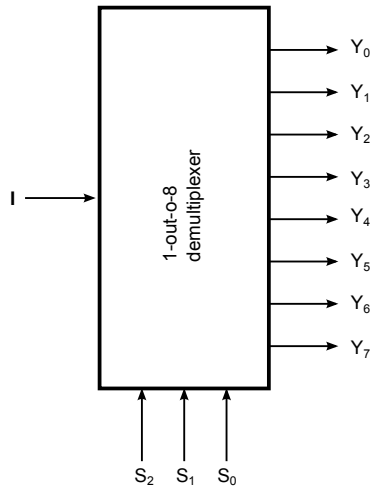
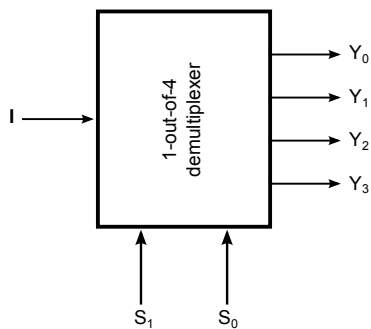
Implementing 8:1 MUX



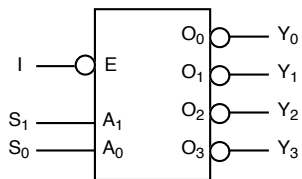
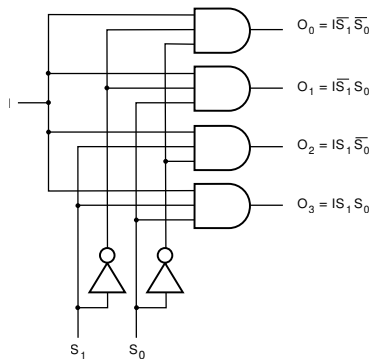
MUX Chips



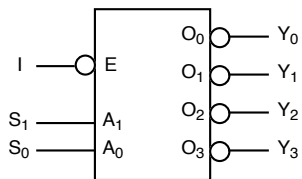
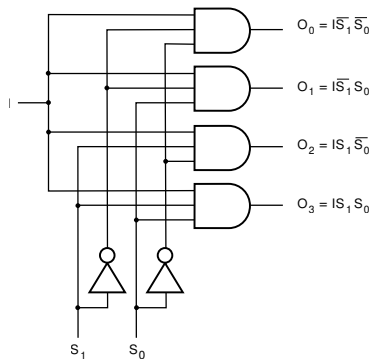
Demultiplexers



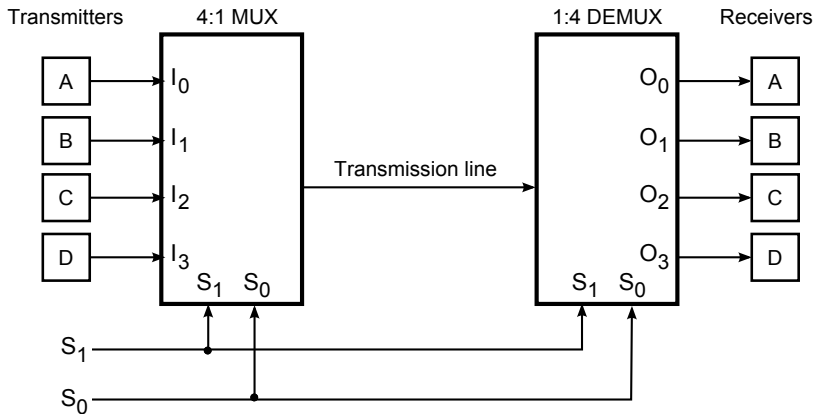
Demultiplexers



Demultiplexers



Demultiplexers





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