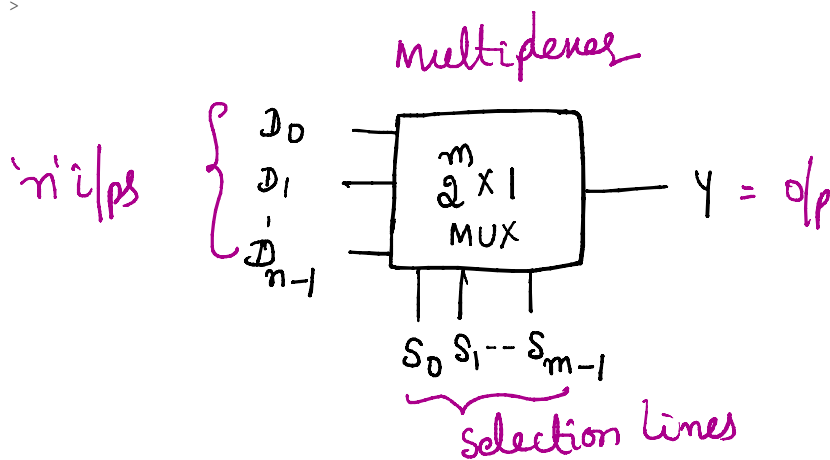
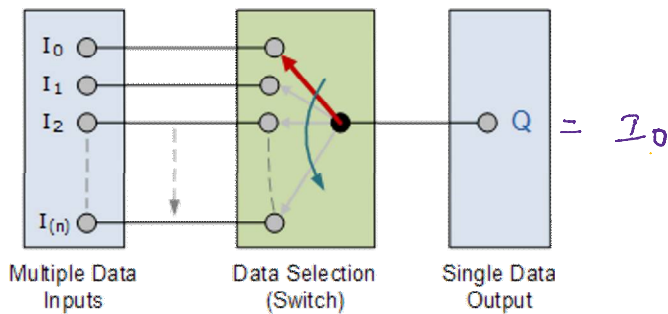


Multiplexer

Multiplexer has many i/p's, depending on selection line, particular i/p will be selected.



$2^m \times 1$ → Size of multiplexer m

$2:1$ MUX $\Rightarrow 2^1:1$ MUX	1	} $2^m = n$
$4:1$ MUX $\Rightarrow 2^2:1$ MUX	2	
$8:1$ MUX $\Rightarrow 2^3:1$ MUX	3	
<u>$10:1$ MUX $\Rightarrow 2^4:1$ MUX</u>	4	$2^m > n$

Condition to design multiplexer is $2^m \geq n$

where m = selection lines

n = no. of inputs

Applications of mux

- ① parallel data to serial data conversion
- ② TDM switch
- ③ Data routing
- ④ waveform generation
- ⑤ Logic function generation
- ⑥ Data selector, because one out of many i/p's are selected.
- ⑦ To realize any boolean function

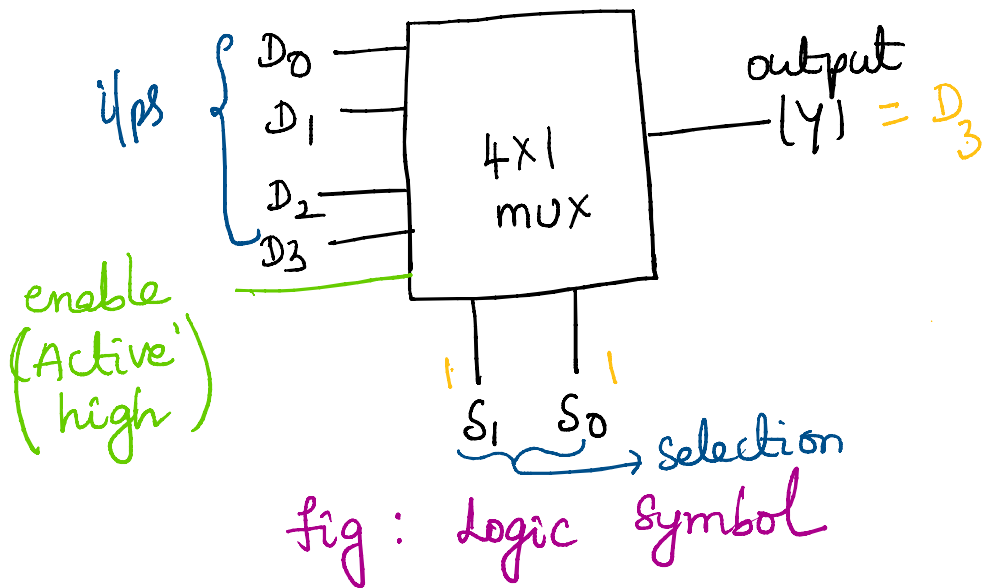
Control i/p in combinational circuit (^Eenable/disable/inhibit/strobed)

when $E = 0$ ckt is disabled } Active high ✓
 $E = 1$ ckt is enabled

when $E = 0$ ckt enabled } Active low
 $E = 1$ ckt disabled

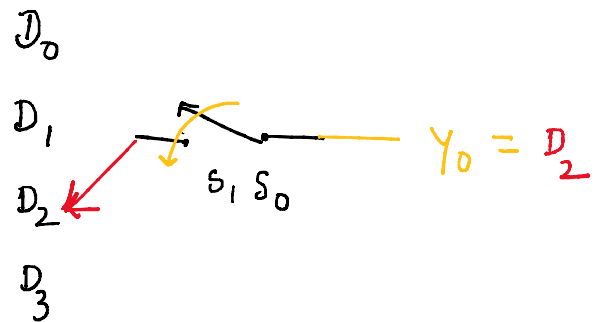
Enable (E) can be either active low (0) or active high

4x1 multiplexer

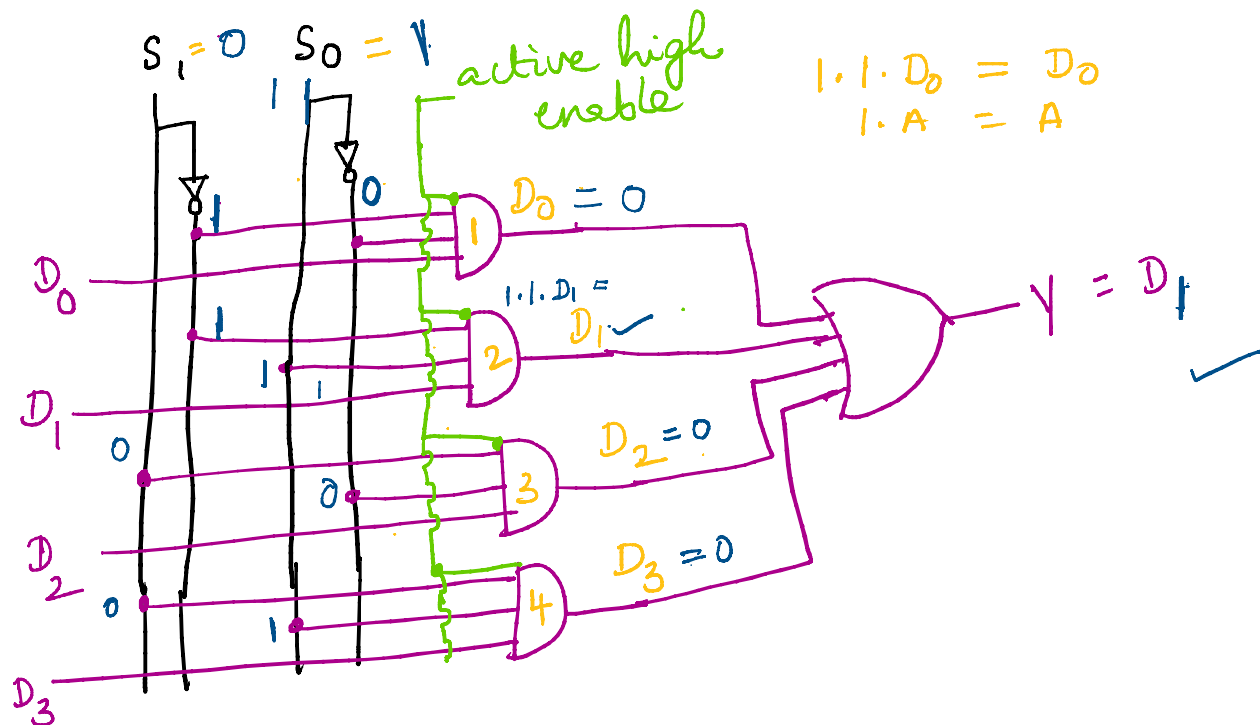


Functional table

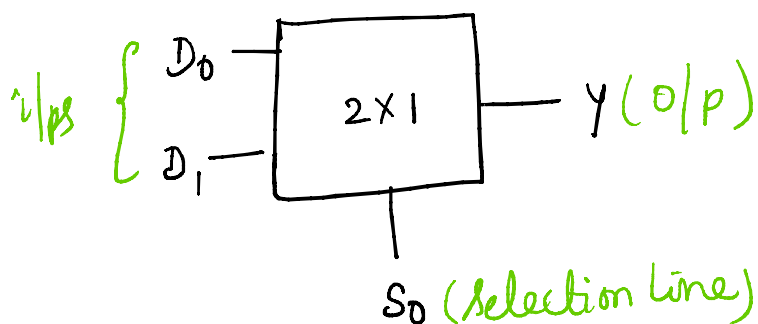
Selection lines		output
S_1	S_0	Y
0	0	D_0
0	1	D_1
1	0	D_2
1	1	D_3



logic diagram for 4x1 MUX



2x1 MUX



Functional diagram

Selection line (S_0)	o/p (Y)
0	D_0
1	D_1

Logic diagram for 2x1 mux (Active high enable)

