C7

Latch Circuits: 74HC75

CHAPTER ASSIGNMENT

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Show your working. You may use the chapter page to help you.

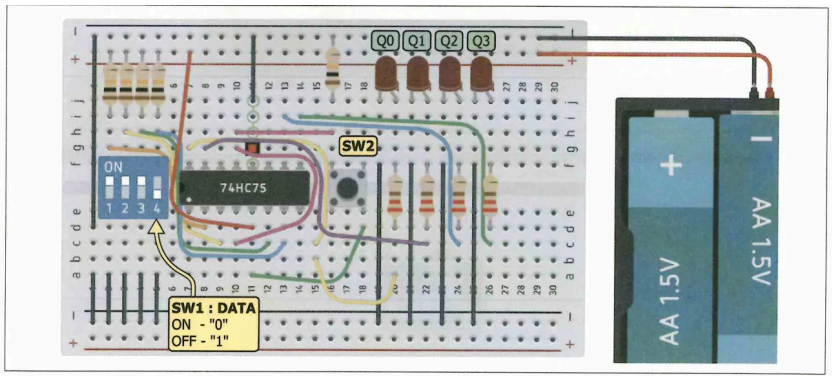
Questions from the Guru Jazzy chapter page, for classroom use.

Labs

7.1 Latch 4 bits of data

1. Build Fig 7-7 in Tinkercad. Set the 4 DIP switches to choose the data, then press SW2 and watch the LEDs. Compare with Fig 7-8.

2. Build it with real parts (Fig 7-9) and repeat step 1.

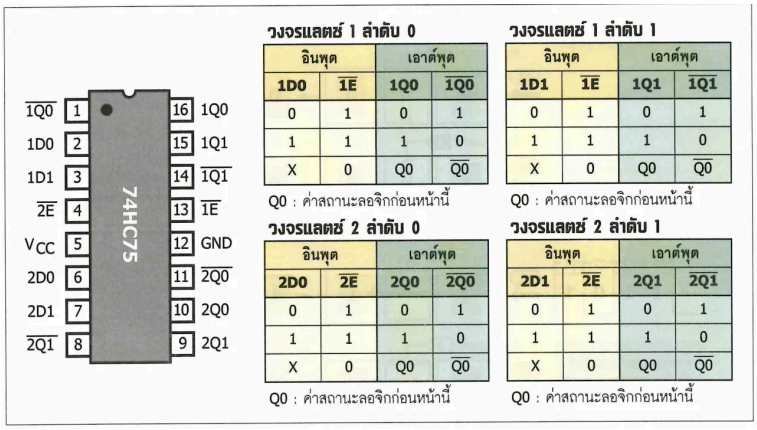


Activity: Predict, then latch

1 Before each press of SW2, write down which LEDs you expect to light. Remember ON = “0”.

2 Set data 1010, press SW2, then change the switches to 0101 *without* pressing SW2. What do the LEDs show? Why?

3 Which two pins of the 74HC75 would you use to latch only bits 0 and 1? Try it.



วงจรแลตช์ 1 ลำดับ 0

อินพุต		เอาต์พุต	
1D0	1E	1Q0	1Q0
0	1	0	1
1	1	1	0
X	0	Q0	Q0

Q0 : ค่าสถานะลอจิกก่อนหน้านี้

วงจรแลตช์ 1 ลำดับ 1

อินพุต		เอาต์พุต	
1D1	1E	1Q1	1Q1
0	1	0	1
1	1	1	0
X	0	Q0	Q0

Q0 : ค่าสถานะลอจิกก่อนหน้านี้

วงจรแลตช์ 2 ลำดับ 0

อินพุต		เอาต์พุต	
2D0	2E	2Q0	2Q0
0	1	0	1
1	1	1	0
X	0	Q0	Q0

Q0 : ค่าสถานะลอจิกก่อนหน้านี้

วงจรแลตช์ 2 ลำดับ 1

อินพุต		เอาต์พุต	
2D1	2E	2Q1	2Q1
0	1	0	1
1	1	1	0
X	0	Q0	Q0

Q0 : ค่าสถานะลอจิกก่อนหน้านี้

Chapter quiz

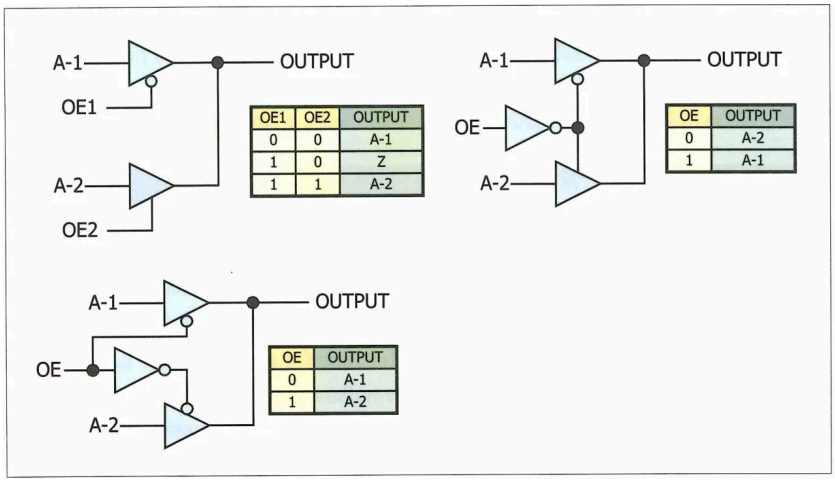
1 What does the “Z” state of a tri-state buffer mean?

A	B	C	D
Logic 0	Logic 1	High impedance — the output floats, as if disconnected	A short circuit

2 A buffer with an active-low enable (OE with a bar) has OE = 0 and A = 1. What is Y?

A. 0 B. 1 C. Z D. It toggles

3 Why can two tri-state buffers share one output wire (Fig 7-2)?



A	B	C	D
Because both always output 0	Because only one is enabled at a time; the other is in Z	Because buffers are resistors	Because the wire has a fuse

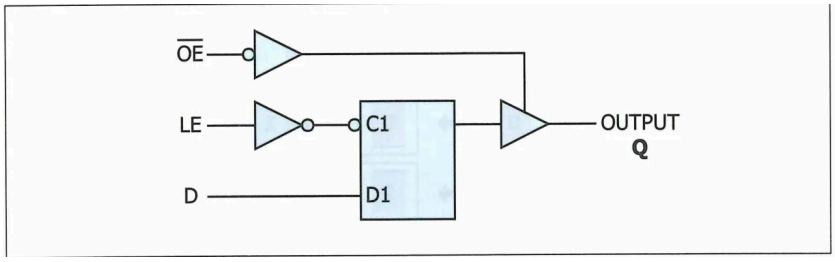
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4 What is the key difference between a buffer and a latch?

A	B	C	D
A latch is faster	A latch can hold its output even when the input changes	A buffer stores 8 bits	There is no difference

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5 In the 1-bit latch (Fig 7-4), what lets the data on D through to Q?



A	B	C	D
Only LE = 1	Only OE = 0	LE = 1 to latch the data in, and OE = 0 to enable the output	Nothing — Q always equals D

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6 How many latches does a 74HC75 contain?

A. 1 B. 2 C. 4 D. 8

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7 In the test circuit, a DIP switch is ON. What does that data input read?

A. “1” B. “0” C. Z D. It depends on SW2

8 You change the DIP switches but do not press SW2. What do the LEDs do?

A	B	C	D
Change at once to the new data	Keep showing the old data	All go off	All come on

End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/tinkercad/chapter-7-latch/