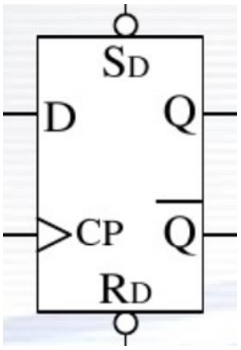
Practice 4　Flip flop and counter

1. D flip flop test

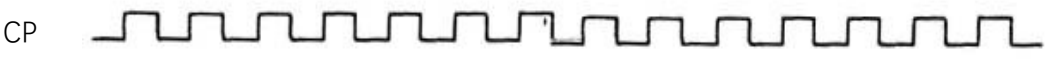
74LS74 is ascending edge trigger D flip-flop (from 1 to zero). 74LS74 has two internal D flip-flops. The truth table of 74LS74 can be found in your system. Your task is to test and fill in the truth table.

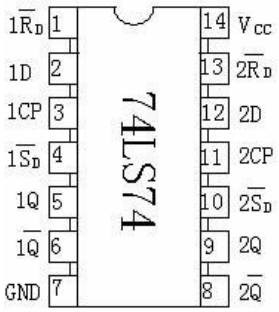
1、 Test Sd(set), Rd(reset) function
2、 CP is clock pulse (press button switch on and down)
3、 Q^n, Q^{n+1} stand for previous state and current state
4、 D is input, Test D flip-flop function, that is to let D=0, D=1, use single pulse or to observe the output
(Sd, Rd set or reset, then Sd=Rd=1)



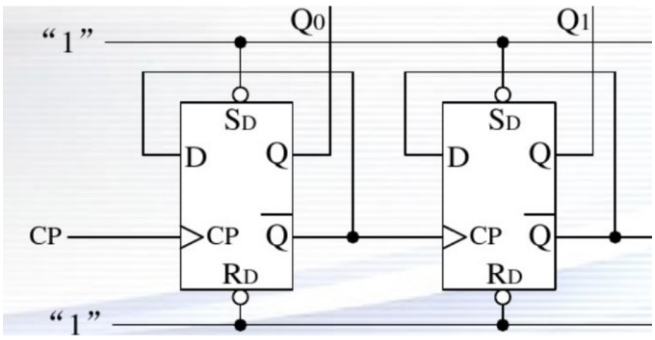
Q=D　　at CP rising edge
Q is unchanged　　at others

$\overline{S}_d$ $\overline{R}_d$	CP	D	Q^n	Q^{n+1}
0 1	X	X	1	
			1	
1 0	X	X	0	
			0	
1 1	↑	0	0	
			1	
1 1	↑	1	0	
			1	
1 1	0 (1)	X	0	
			1	





2. Use D flip-flop build counter



Base 4 counter

3. Use logic analyzer to observe the base4 counter waveform