

Experiment : (11)

Title: Sequence Detectors (Johnson, Ring Counter)

Theory: A Ring counter is a type of digital sequential circuit built from a shift-register whose serial output is fed back to its serial input, forming a closed ring. The output of the last flip-flop is routed back to the ~~output~~ input of the first, so each clock pulse shifts the single "1" one position around the ring.

Johnson counter is a switch-tail ring counter where the complement output of the last flip-flop connected to the input of the first flip-flop.

Required Instruments:

- i) D-flip-flop (4013)
- ii) Logic Probe
- iii) Logic state
- iv) clock
- v) breadboard
- v) LED
- vi) Wires
- vii) power supply

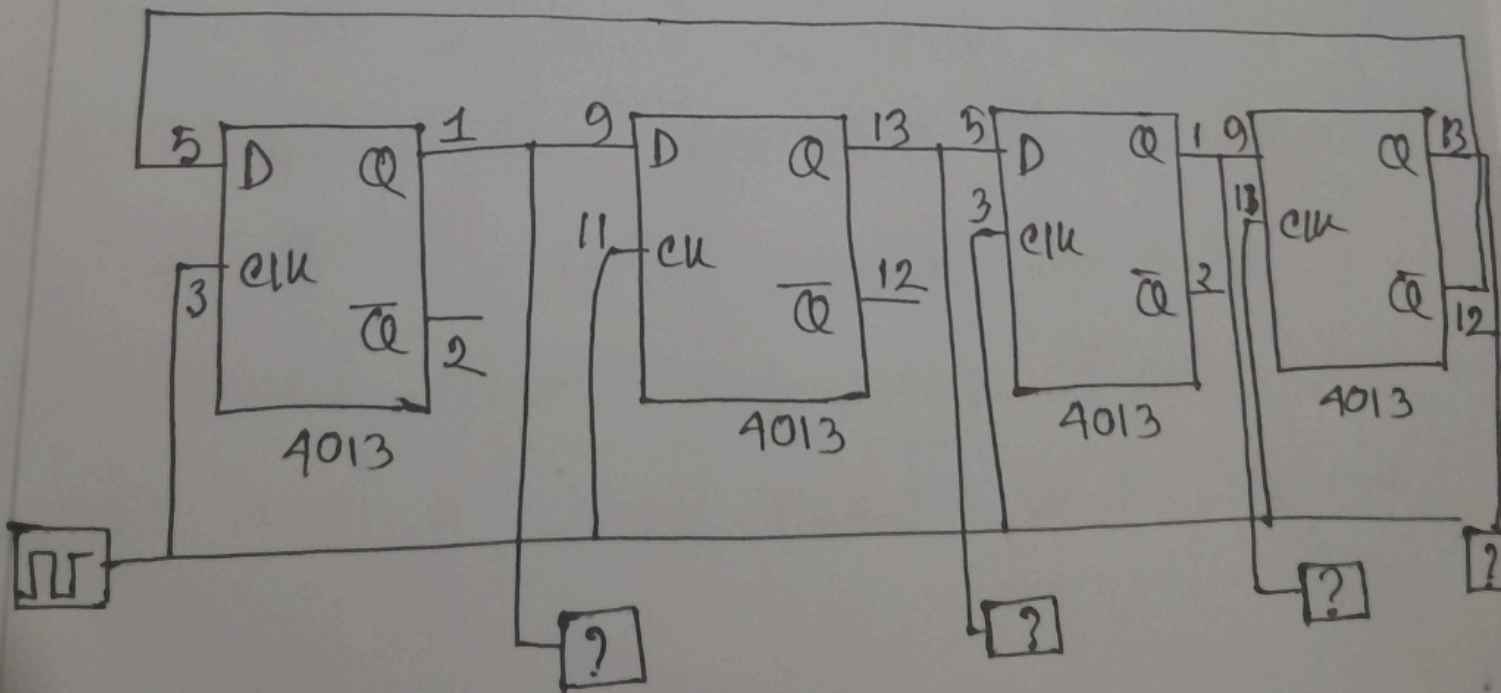
Truth table: Ring counter

clk seq	A	B	C	D
1	1	0	0	0
2	0	1	0	0
3	0	0	1	0
4	0	0	0	1
5	1	0	0	0
6	0	1	0	0
7	0	0	1	0
8	0	0	0	1
9	<u>1</u>	0	0	0

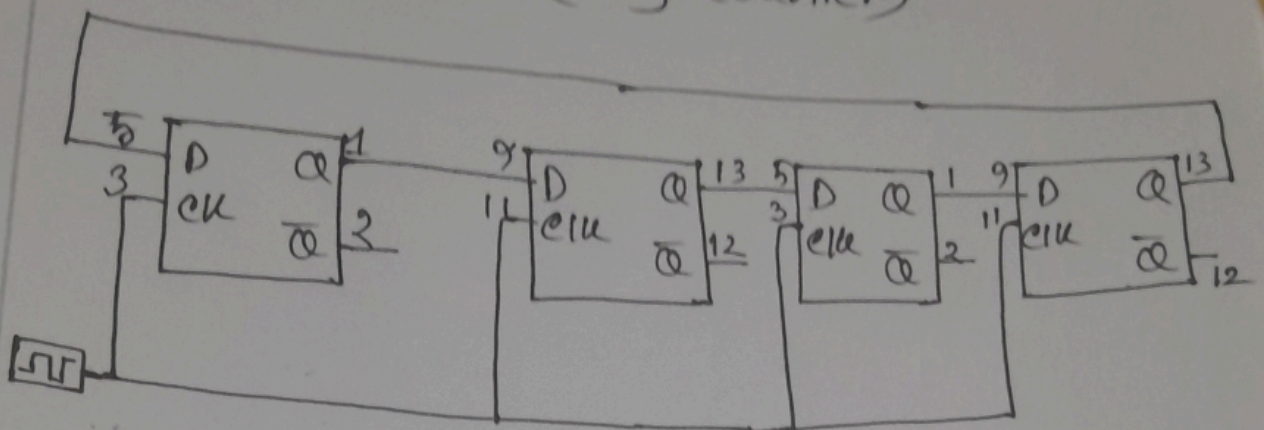
truth table: (Johnson counter)

Seq Number	A	B	C	E
1	0	0	0	0
2	1	0	0	0
3	1	1	0	0
4	1	1	1	0
5	1	1	1	1
6	0	1	1	1
7	0	0	1	1
8	0	0	0	1

logic Diagram: (Johnson Counter)



logic Diagram: (Ring counters)



Conclusion: This experiment successfully demonstrated the working of sequence detectors, Johnson counters and ring counters. we used the truth table to examines the operation of the basic logic gates. Both counters give a self contained, repeating sequence of states with just a shift register and feedback.