



INSTITUTE OF INFORMATION TECHNOLOGY
JAHANGIRNAGAR UNIVERSITY

Number of Lab Report : 04

Name of Lab Report : Ring counter with D flipflop.

Course Title : Digital Logic Design Lab

Course Code : ICT – 2104

Submission Date : 18/02/2021

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Roll – 2023

2nd year 1st Semester

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Experiment name: Ring Counter with D flip-flop.

Objective:

1. To know how to make shift-register Counter.
2. To learn how to run the output in circular motion.

Theory:

The simplest shift-register counter is essentially a circulating shift-register, connected so that the last FF shifts its value into the first FF. This arrangement is drawn in the figure, using D Flip-flop.

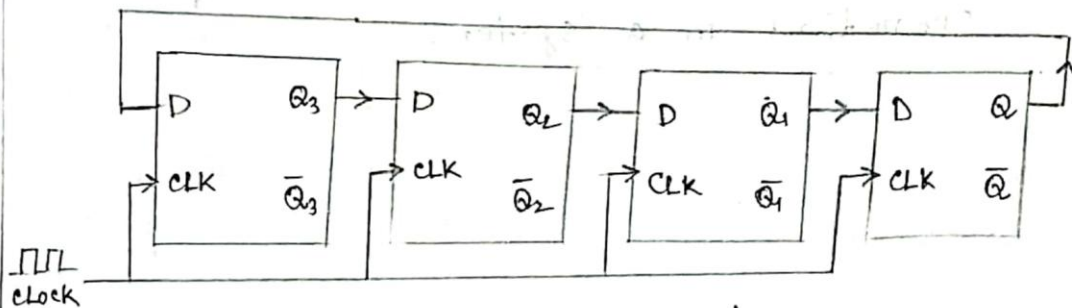


Figure:- 4-bit ring Counter.

The Flip-flop are connected so that information shifts from left to right and back amount from Q_n to Q_1 .

In most instances only a single 1 is in the register and it is made to circulate around the register as long as clock pulses are applied. For this reason it is called a ring Counter.

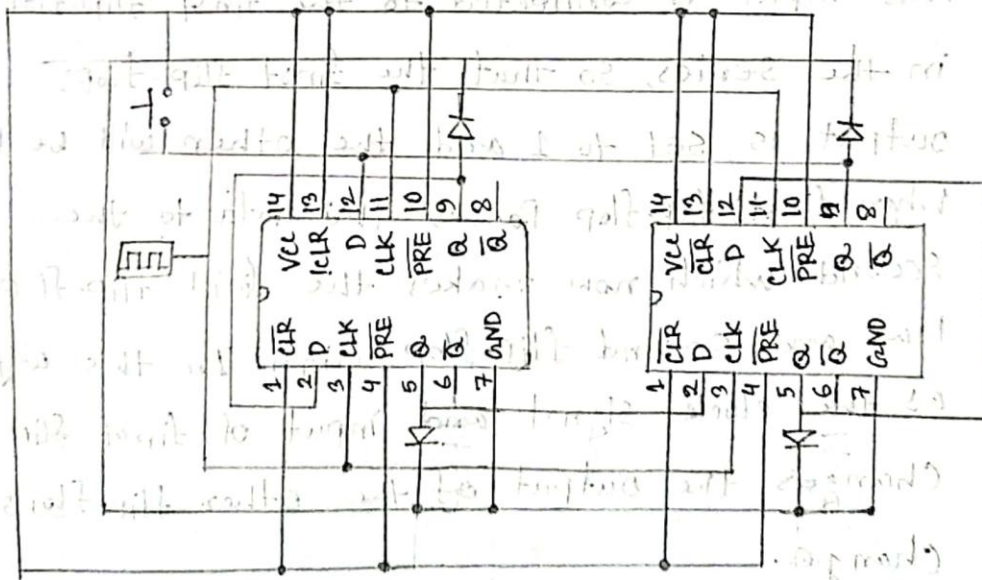
Despite the fact that it is less efficient in the use of flip-flop a ring Counter is still useful because no decoding gate is needed to decode this. This counter is especially better in application where the counter is being used to control the sequencing of operations in a system.

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E802-11-23

Apparatus:

1. Bread board
2. LED (4)
3. 7474 IC (4 Pins)
4. Capacitor (1 μ F)
5. Resistors (1M, 100K)
6. Connecting wires
7. Power Source.

Working Diagram:

Working Procedure:

After placing all the components as drawn in the diagram to operate properly a '1' data is passed through one flip-flop. By inputting '1' data we will pass it through the flip-flops. By passing the reset signal initially the flip-flops are at RESET state. When the PRESET is applied to the ring counter, the input of the circuit becomes 1.

This input is connected to the first flip-flop in the series, so that the first flip-flop output is set to 1 and the other will be low. When first flip-flop passes the data to the second which now makes the first flip-flop low and second flip-flop high. In this way, as the clock signal and input of first flip-flop changes the output of the other flip-flops change.

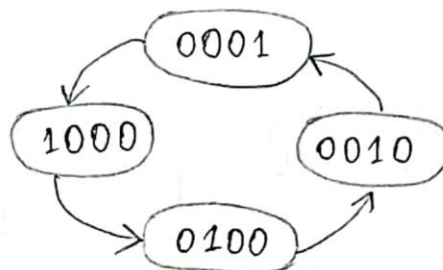
As the last output is connected to the first input the data sequence rotates or circulates in the ring counter.

Result:

Observed 4-bit ring Counter

Q_3	Q_2	Q_1	Q
1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Sequence:



The ring counter is Prepared and observed Properly.

Reference:

1. Digital System Principles and Applications
12th edition by Ronald J. Tocci

2. www.Quora.Com

3. www.Academia.Com

[Access Date: 17.02.2021]

THE END