Assignment No. 4.

Title :- Ring counter and Johnson Ring Counter.

Problem Statement :- Design and Realization of Ring Counter and Johnson Ring Counter.

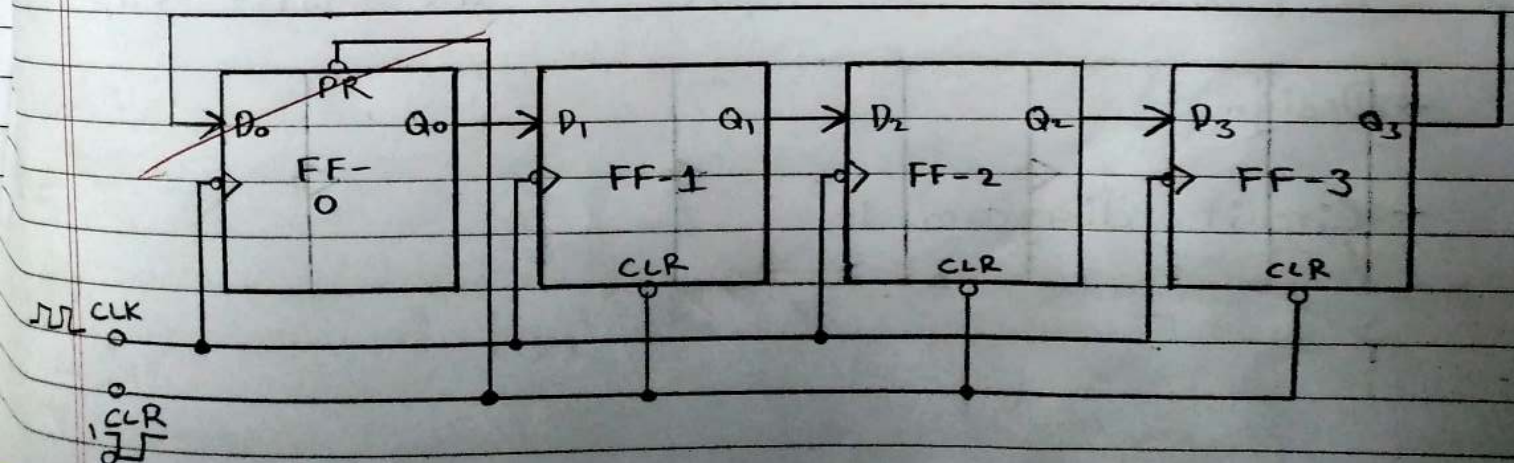
Hardware and software requirements :-

Theory :-

- Ring Counter : A ring counter is a special type of application of the Serial In Serial OUT Shift Register. The only difference is that the last flip-flop outcome is taken as the output in shift register. But in the ring counter, this outcome is passed to the first FF as an input.

Design :-

- circuit diagram :-



- Truth table :-

CLR	CLK	Q_0	Q_1	Q_2	Q_3
0	X	1	0	0	0
1	↓	0	1	0	0
1	↓	0	0	1	0
1	↓	0	0	0	1
1	↓	1	0	0	0

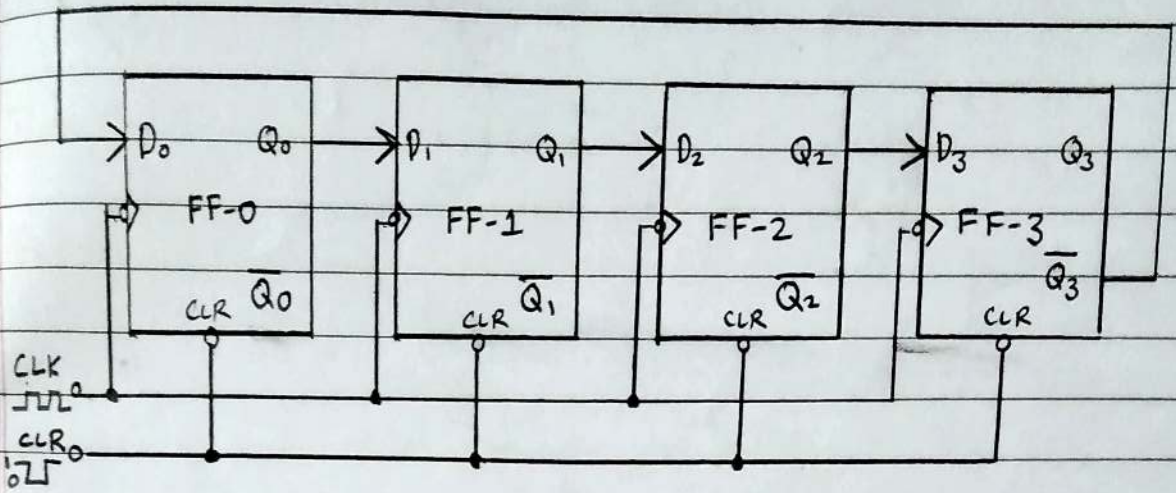
- Applications :-

1. Ring counters are used in those applications in which several operations are to be controlled in a sequential manner.
2. For example in resistance welding the operations called ~~seq~~ squeeze, hold, weld and off are to be performed sequentially.
3. We can use ring counter to initiate these operations.

- Johnson counters : It is similar to ring counter but the only difference is that in the Johnson counter the inverted outcome 'Q' of the last flip-flop is passed as an input to the first flip-flop.

* Design

- Circuit diagram :-



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1	↓	0	0	1	1
1	↓	0	0	0	1
1	↓	0	0	0	0
1	↓	1	0	0	0

- Applications :-

1. They are used as frequency dividers and pattern recognizers.
2. It can be used as a synchronous decade counter and divider ~~etc~~ circuit.
3. They are used in function generator to produce square waves

Conclusion :- Hence, ring counter and Johnson Ring counter studied