Assignment:
4-Bit Ring Counter on Arduino

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I. ABSTRACT

A ring counter is a special type of application of the Serial IN Serial OUT Shift register. The only difference between the shift register and the ring counter is that the last flip flop outcome is taken as the output in the shift register. But in the ring counter, this outcome is passed to the first flip flop as an input. All of the remaining things in the ring counter are the same as the shift register.

In this program, an LED was used for checking the output. The last flip-flop output was connected with the input of the initial flip-flop and Led bulb as well, to get the result.

A. Truth Table for Ring Counter

Truth Table for Ring Counter is given in Table: I

ORI	CLK	Q_0	Q_1	Q_2	Q_3
low	X	1	0	0	0
High	Low	0	1	0	0
High	Low	0	0	1	0
High	Low	0	0	0	1
High	Low	1	0	0	0

TABLE I

II. COMPONENTS

Required components list given in Table: II.
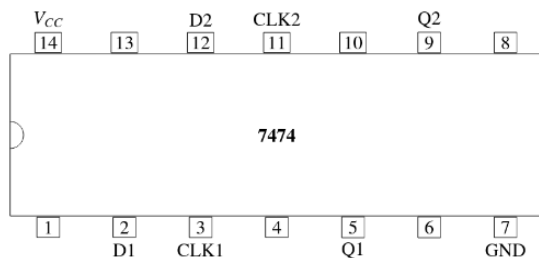Flip-flop IC 7474 diagram is shown in Figure 1.

Fig. 1.

III. HARDWARE

Make the connections between Arduino and LED as per the Table: III

IV. SOFTWARE

Download the codes given in the link below and execute them. https://github.com/rajib05ra/FWC-Assignments/tree/main/Assignment

Components	Value	Quantity
Resistors	220 ohm	1
LEDs		1
Arduino	UNO	1
Jumper Wires		20
Breadboard		1

TABLE II

	INPUT	INPUT	OUTPUT	OUTPUT	CLOCK	CLOCK
7474	2	9	5	12	CLK1	CLK2
7474	2	9	5	12	CLK1	CLK2
Arduino						13
LED	LED1				LED1	

TABLE III

V. CONCLUSION

A ring counter is a typical application of the Shift register. Here the output of the last flip-flop is connected to the input of the first flip-flop, which shift the register.After that, at each clock pulse, the preseted 1 is shifted to the next flip-flop and thus forms a Ring