Green University

ASSIGNMENT

CLP–04

Section : DC-221

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Subject : CSE-204 DC

Date : 08 / 06 / 2023

"Advancing knowledge. Transforming lives"

Task number 01 : Implement the J-K flip-flop and verify with the truth table.

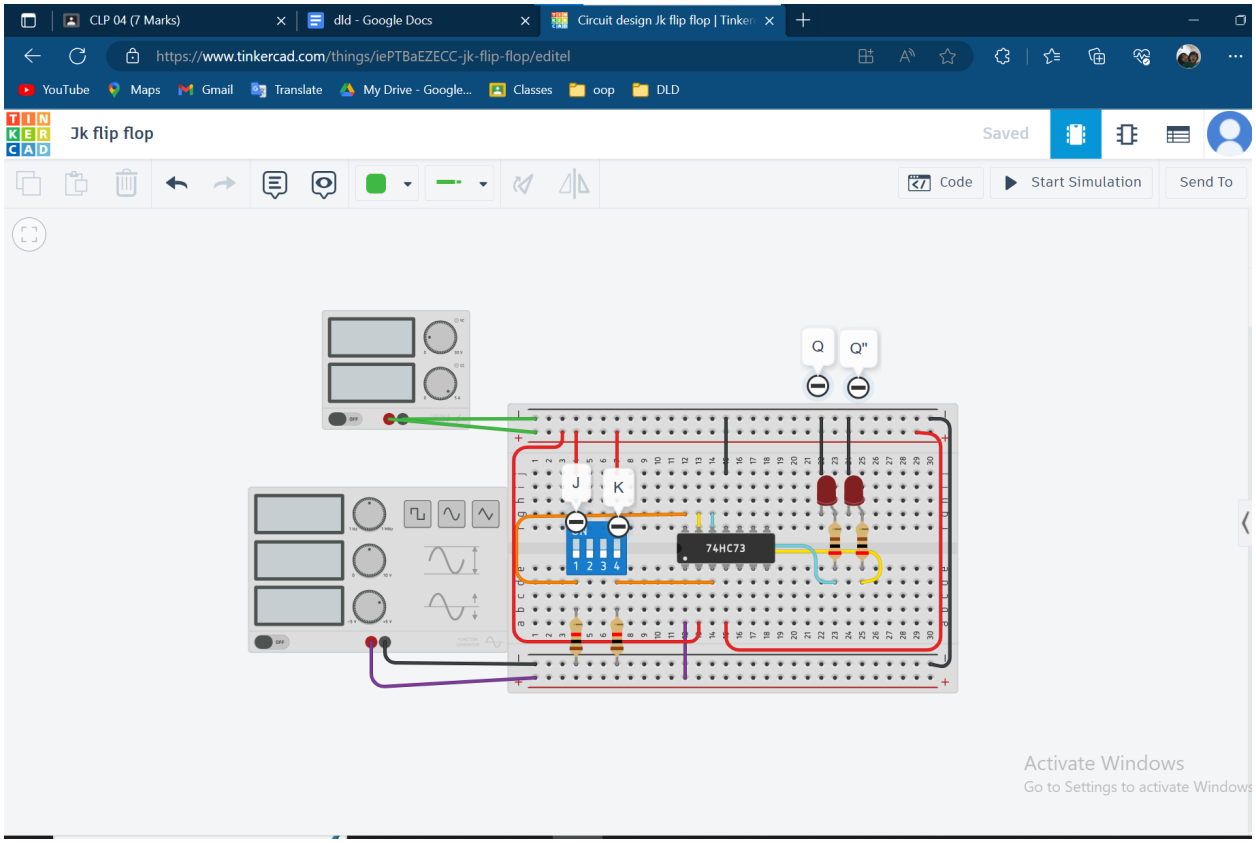
Component List :

Name	Quantity	Component
U1	1	Dual J-K Flip-Flop
FUNC1	1	1 Hz, 5 V, 2.5 V, Square Function Generator
D1 D2	2	Red LED
R1 R2	2	0.2 kΩ Resistor
R3 R4	2	1 kΩ Resistor
P1	1	5 , 5 Power Supply
SW1	1	DIP Switch SPST x 4

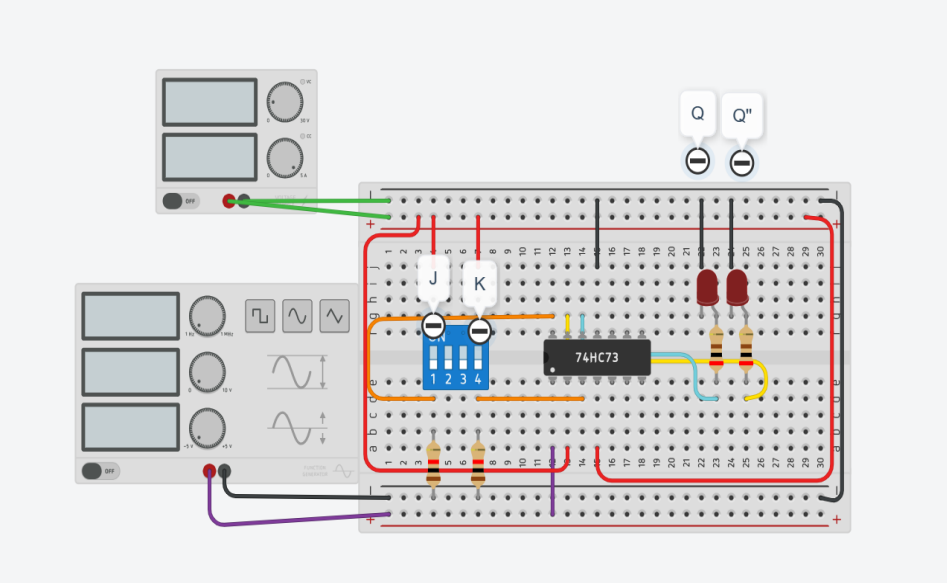
Truth Table :

Clk	J	K	Q	Q'	State
1	0	0	Q	Q'	No change in state
1	0	1	0	1	Resets Q to 0
1	1	0	1	0	Sets Q to 1
1	1	1	-	-	Toggles

Tinkercad Circuit View :



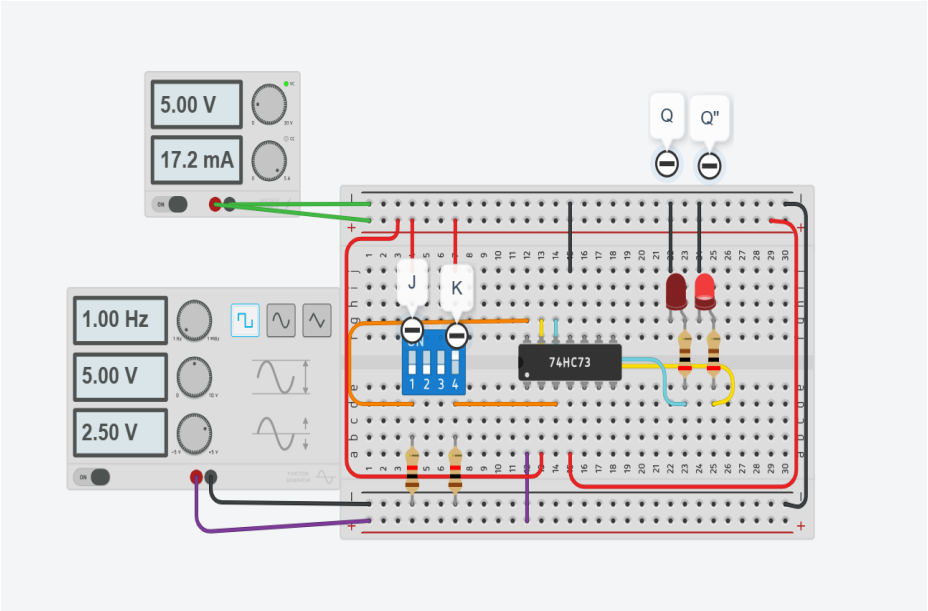
Implementation JK flip flop :



Here

J = 0
K = 0
Q = Q
Q" = Q"

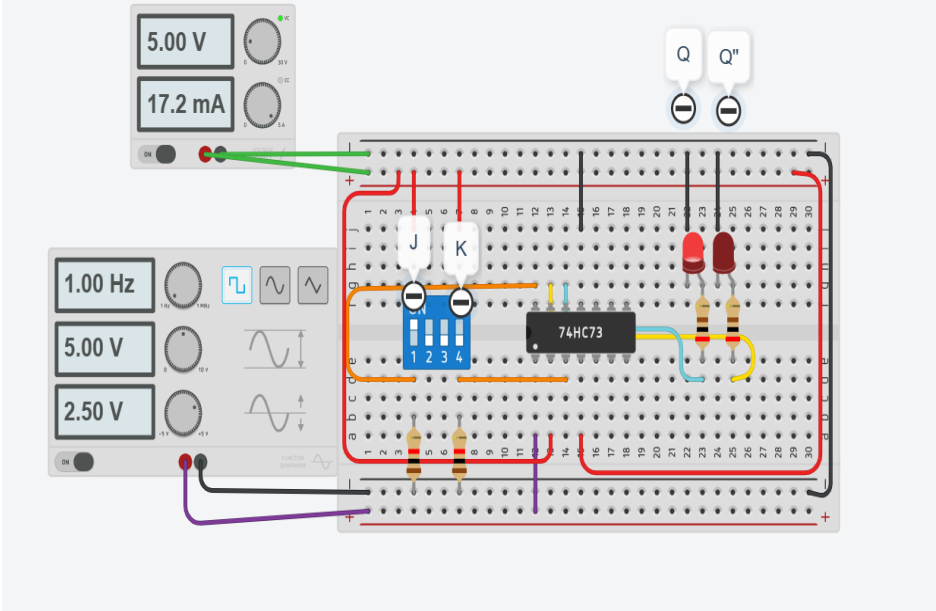
STATE =
NO CHANGE IN
STATE



Here

J = 0
K = 1
Q = 0
Q” = 1

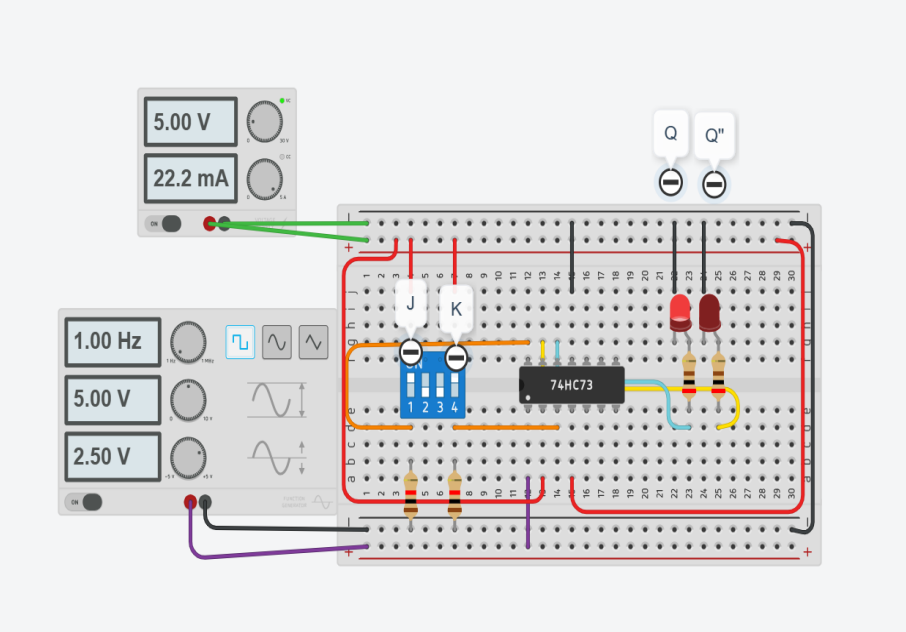
STATE =
RESET Q TO 0



Here

J = 1
K = 0
Q = 1
Q” = 0

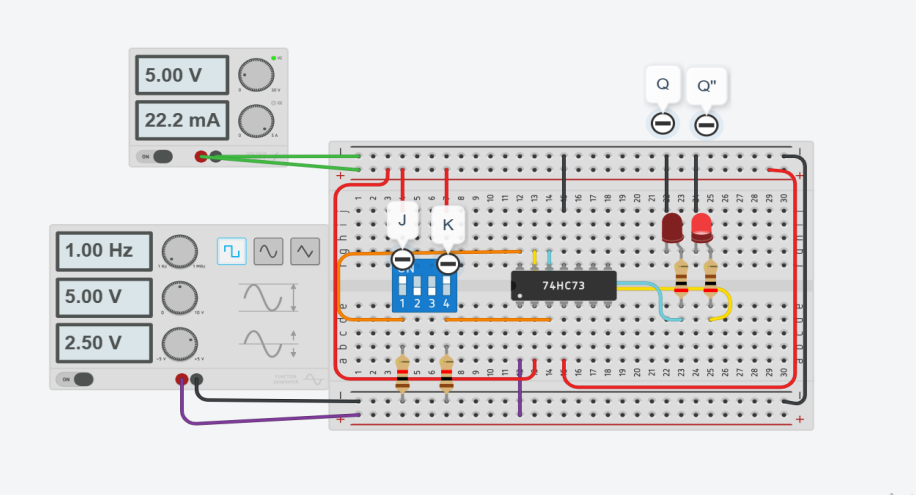
STATE =
SETS Q TO 1



Here

J = 1
K = 1
Q = Q”
Q” = Q

STATE = TOGGLES



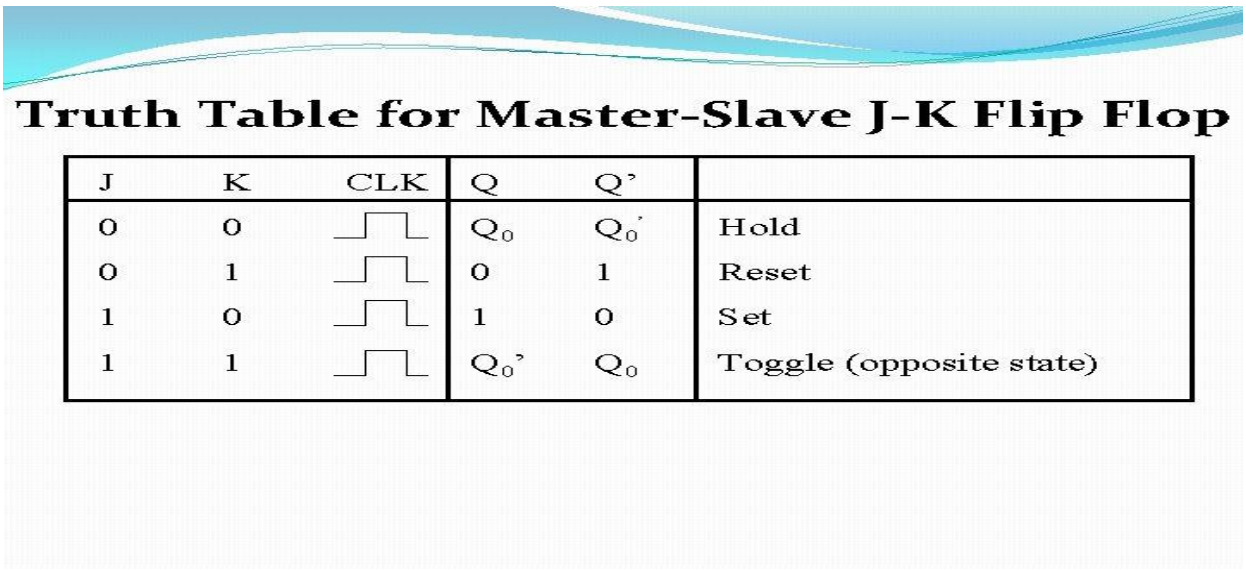
Task number 01 :

Implement a master slave flip-flop with the J-K flip-flop and verify with the truth table.

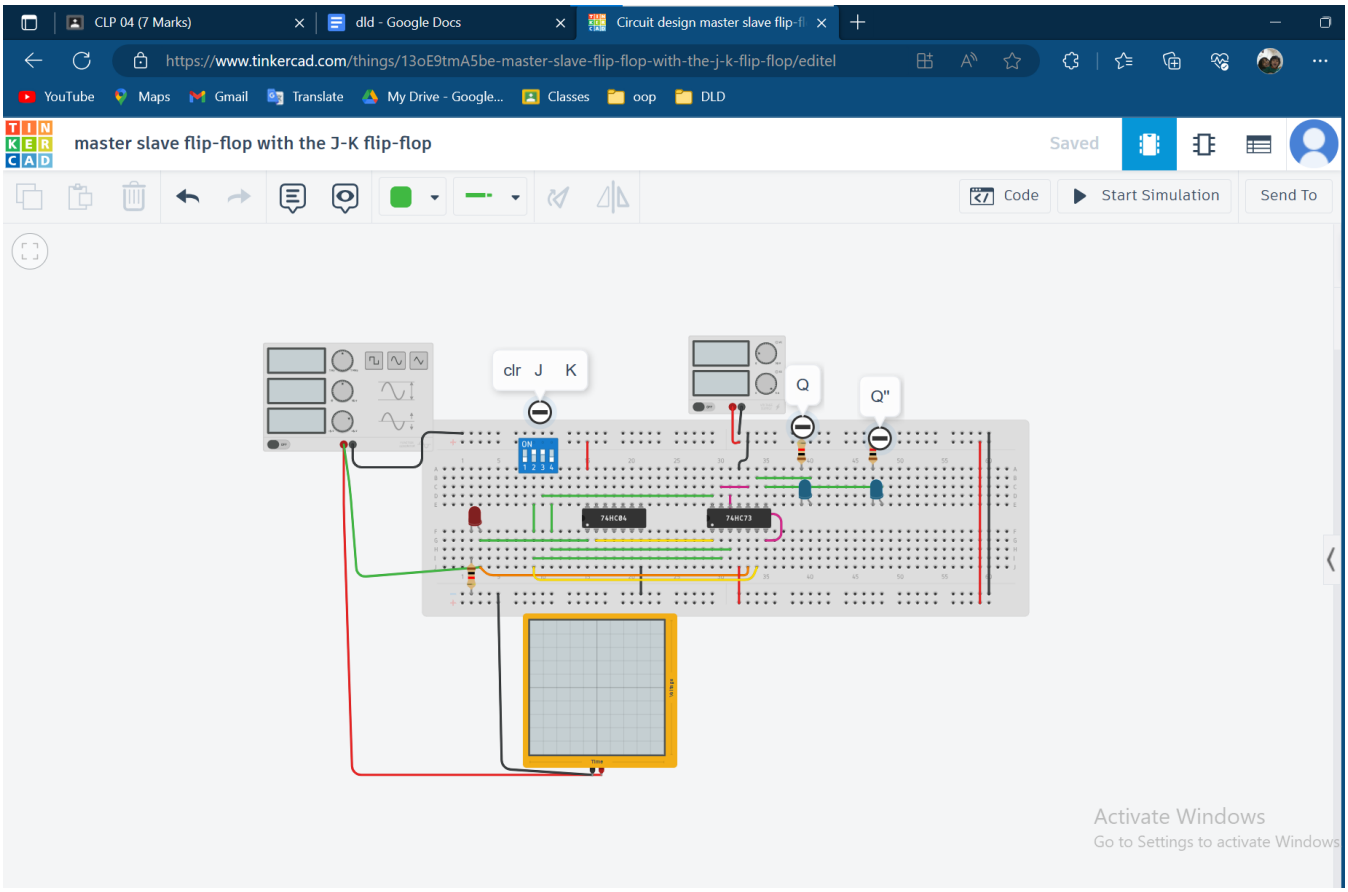
Component List :

Name	Quantity	Component
P1	1	5 , 5 Power Supply
U1	1	Hex Inverter
U2	1	Dual J-K Flip-Flop
FUNC1	1	1 Hz, 5 V, 2.5 V, Square Function Generator
U3	1	100 ms Oscilloscope
D1	1	Red LED
R1 R2 R3	3	1 kΩ Resistor
SW1	1	DIP Switch SPST x 4
D2 D3	2	Blue LED

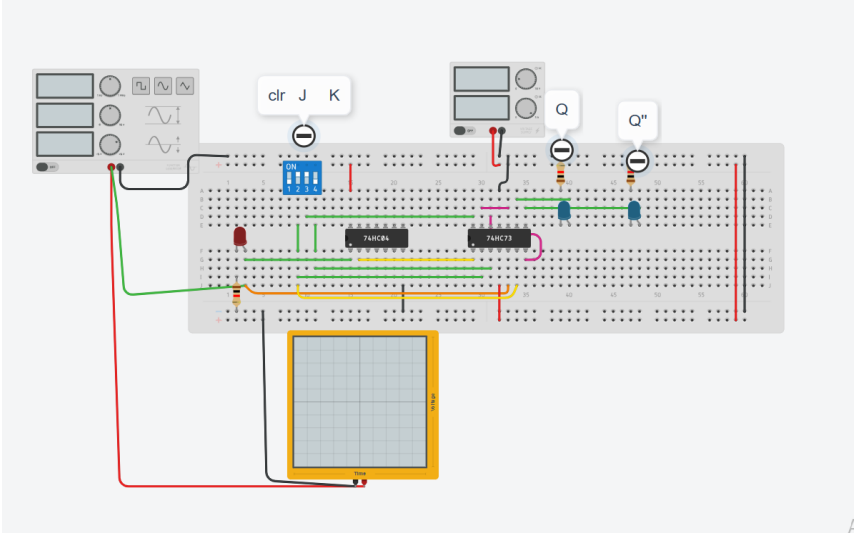
Truth Table :



Tinkercad Circuit View :



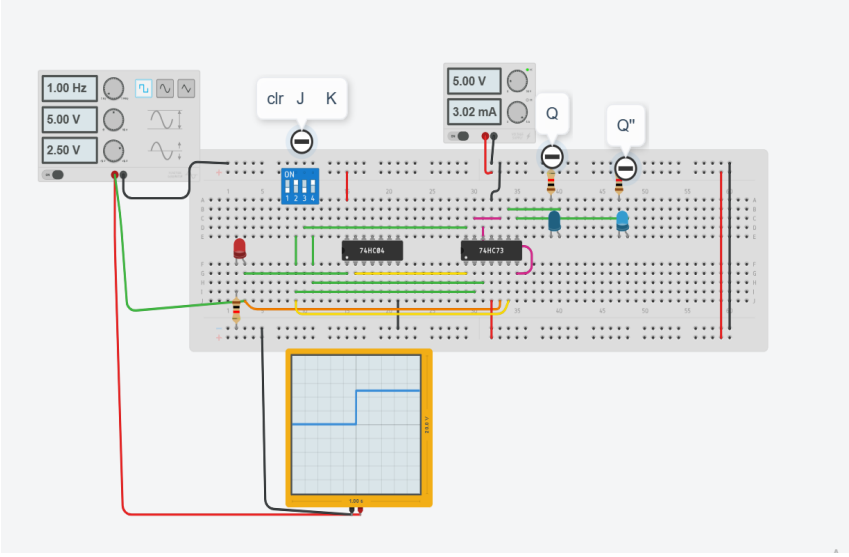
Implementation JK flip flop :



Here

CLK = 1
J = 0
K = 0
Q = Q
Q'' = Q''

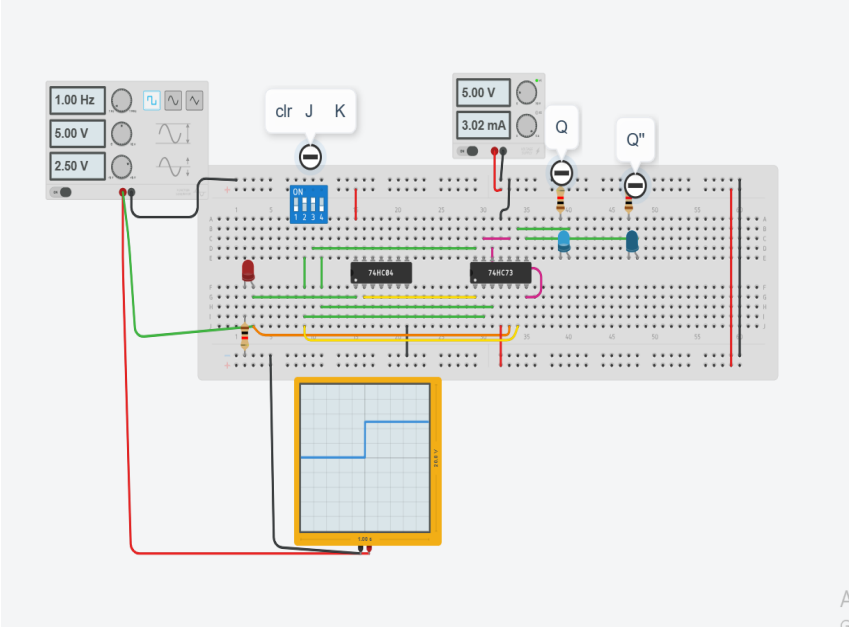
STATE = HOLD



Here

CLK = 1
J = 0
K = 1
Q = 0
Q'' = 1

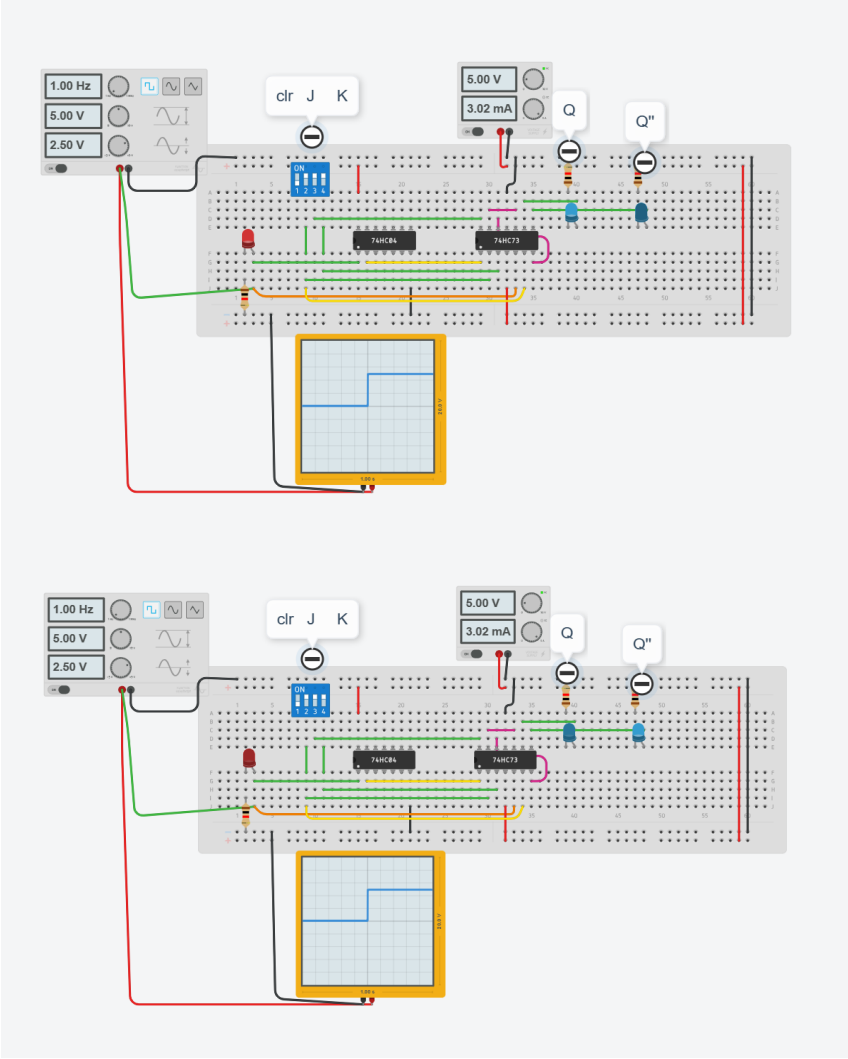
STATE =
RESET



Here

CLK = 1
J = 1
K = 0
Q = 1
Q'' = 0

STATE =
SET



Here

CLK = 1
J = 1
K = 1
Q = Q”
Q” = Q

STATE =
TOGGLE(OPPOSITE SITE)

——— END ———