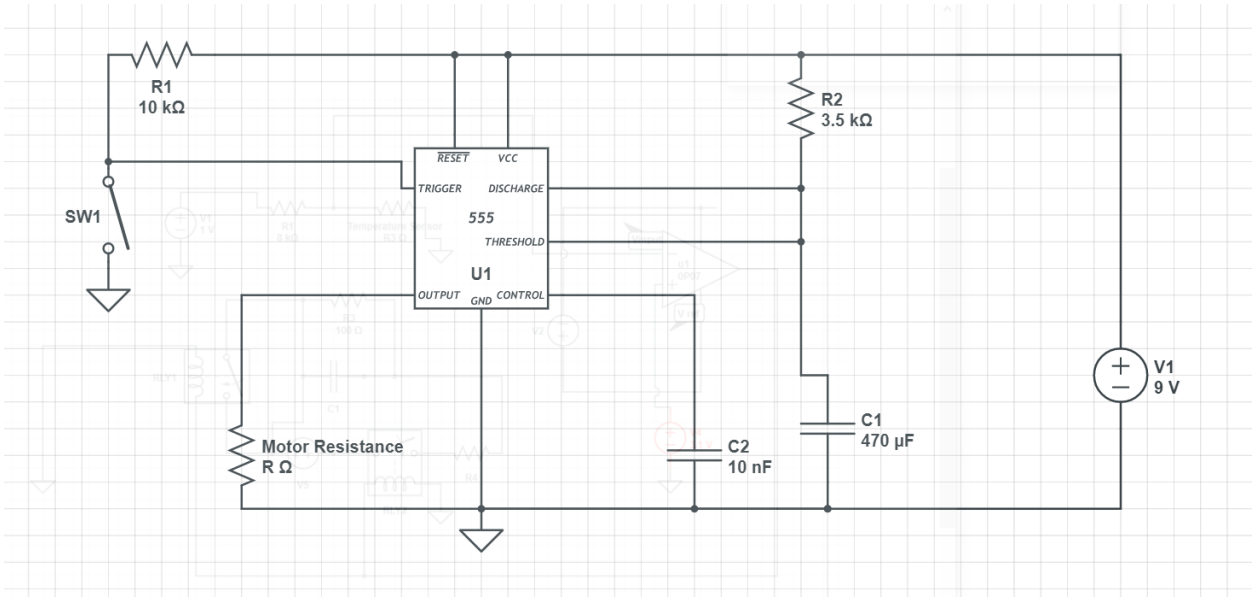
Mechatronics Assignment 3

-Tanish Goel, 21ME10115

Circuit Components:

1) Motor
2) Two capacitors
3) 555 Timer
4) Resistances
5) Switch
6) Wires



[1- GROUND,2- TRIGGER, 3- OUTPUT, 4- RESET, 5- CONTROL, 6-THRESHOLD, 7-DISCHARGE,8- VCC]

Procedure and Explanation:

Timer IC here acts in monostable mode
When we apply a short negative pulse of voltage to pin 2, the output of pin 3 becomes high that is the circuit connected between pin 3 and the ground gets activated, and it gets a high pulse for a period of time.

Pin 2 is connected to VCC through a resistor. and the junction is connected to the ground through a pushbutton switch.

When the switch is pressed for a very short instant, the ground is connected to the pin2 momentarily and we get a short low pulse in 2, and output of 3 gets activated for the characteristic time T.

The mechanism is based on the charging of the capacitor on the right.
as long as the voltage across the capacitor is less than 2/3Vcc, it keeps charging and we get a const high pulse in output pin 3.
This time of charging is

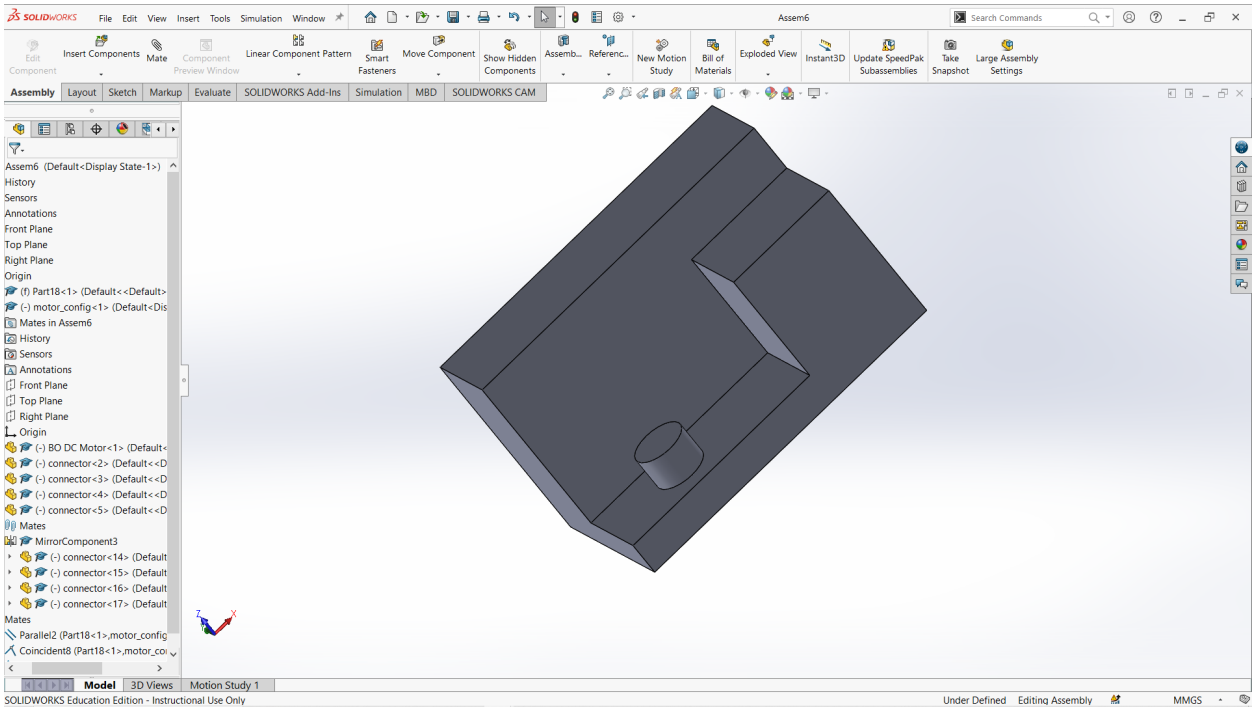
T=1.1*RC=1.5s, from this R=3.5 Kohms

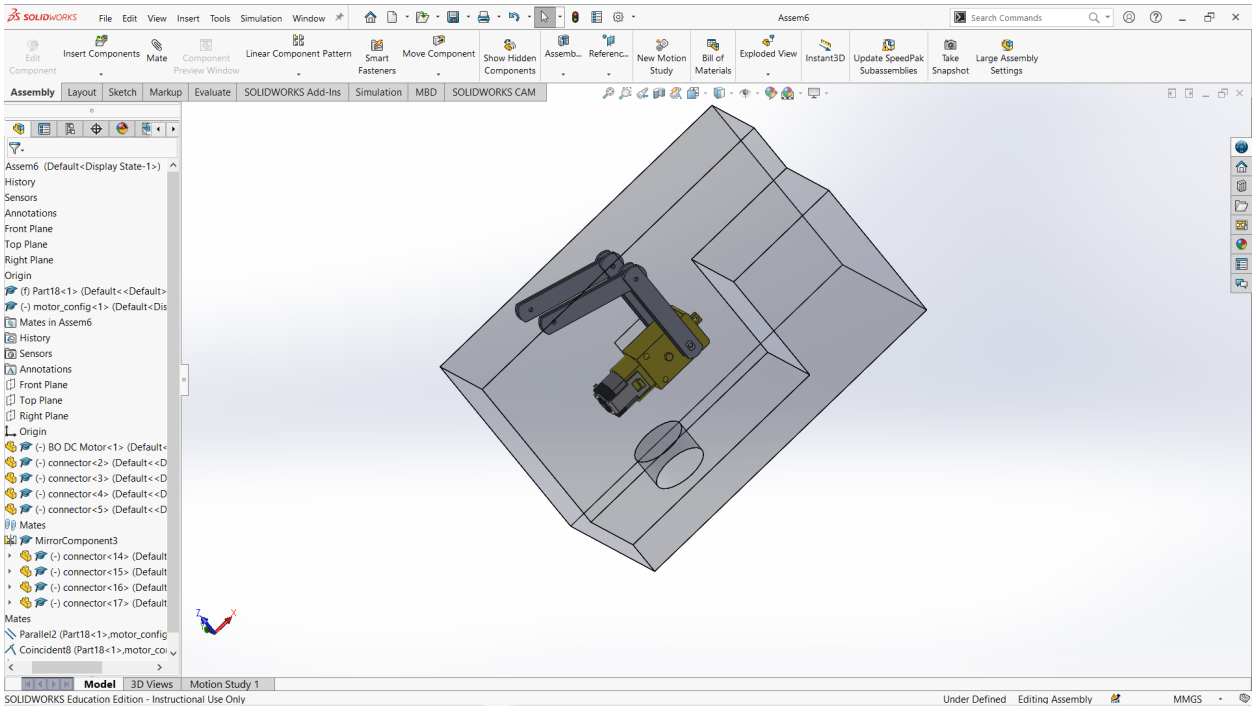
After the capacitor voltage becomes greater than this value of 2/3 VCC (checked using a voltage comparator fixed inside the ic) it leads to discharging of the capacitor and resets the output pin and the circuit is again disconnected.

CAD Model:

The cad model basically shows a circular button that on pressing activates the circuit shown above. The front rectangle shows battery storage.

The motor can be attached through the bolts leaving sufficient space from the back so as to allow the free rotation of the parts.
The remaining right side of the structure can be used for storing the deposits.

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Model 3D Views Motion Study 1
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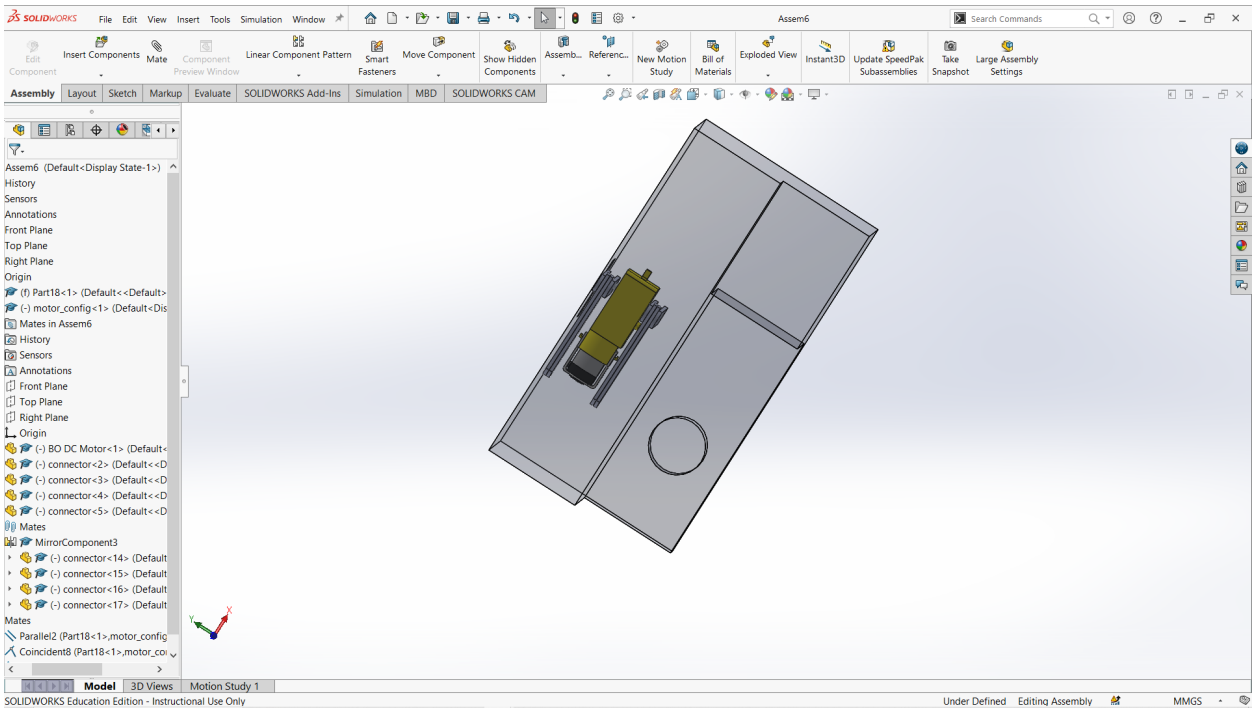
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