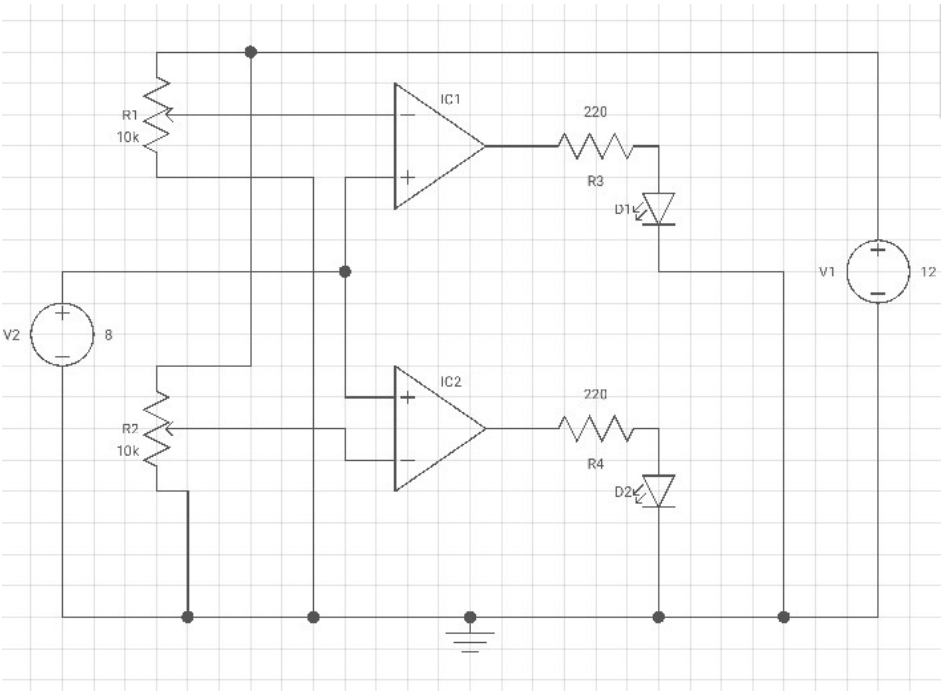
BATTERY VOLTAGE LEVEL INDICATOR

Objective of the project: To indicate two voltage levels of battery (3V & 9V) by using two LEDs and op amp comparator circuit.

Description of the project: Battery level indicator indicates the status of the battery just by glowing LED's. All rechargeable batteries have their specific level of charging and discharging; they are likely to get damaged if the battery voltage exceeds that level. The circuit of battery voltage monitor is fabricated and designed around op-amp IC UA741 configured as comparator. Here two LEDs are used as indicators and indicates two voltage level states of a 12V battery. Potentiometers R_1 and R_2 are used as potential dividers of voltage monitor circuit to set the reference voltage levels. When voltage level rises above 9 volts, the output from IC_1 and IC_2 goes high, as a result LEDs D_1 and D_2 begins to emit light. Similarly, when the voltage falls below 9 volts but is above 3 volts, the output of only IC_2 goes high and only the LED D_2 start to emit light. For below 3 voltage level, none of the LEDs will glow. Resistors R_3 and R_4 are used as current limiter for LEDs. The potentiometer can be used to change the reference voltage levels. Here, the battery V2 is the battery to be tested.

Circuit diagram:



Specifications:

R1, R2 = 10 K Ω (Potentiometer)

R3, R4 = 220 Ω

IC1, IC2 = IC UA741

D1, D2 = LED

V1 = 12V Battery

Applications:

1. To measure car battery voltage levels.
2. To prevent overcharging of batteries.

Conclusion: Using this circuit, we can easily determine the voltage level of a battery. Though we can only determine two specific threshold voltage levels of the battery by using this circuit, we can extend the logic used in the circuit to include more than two LEDs to indicate multiple voltage levels.