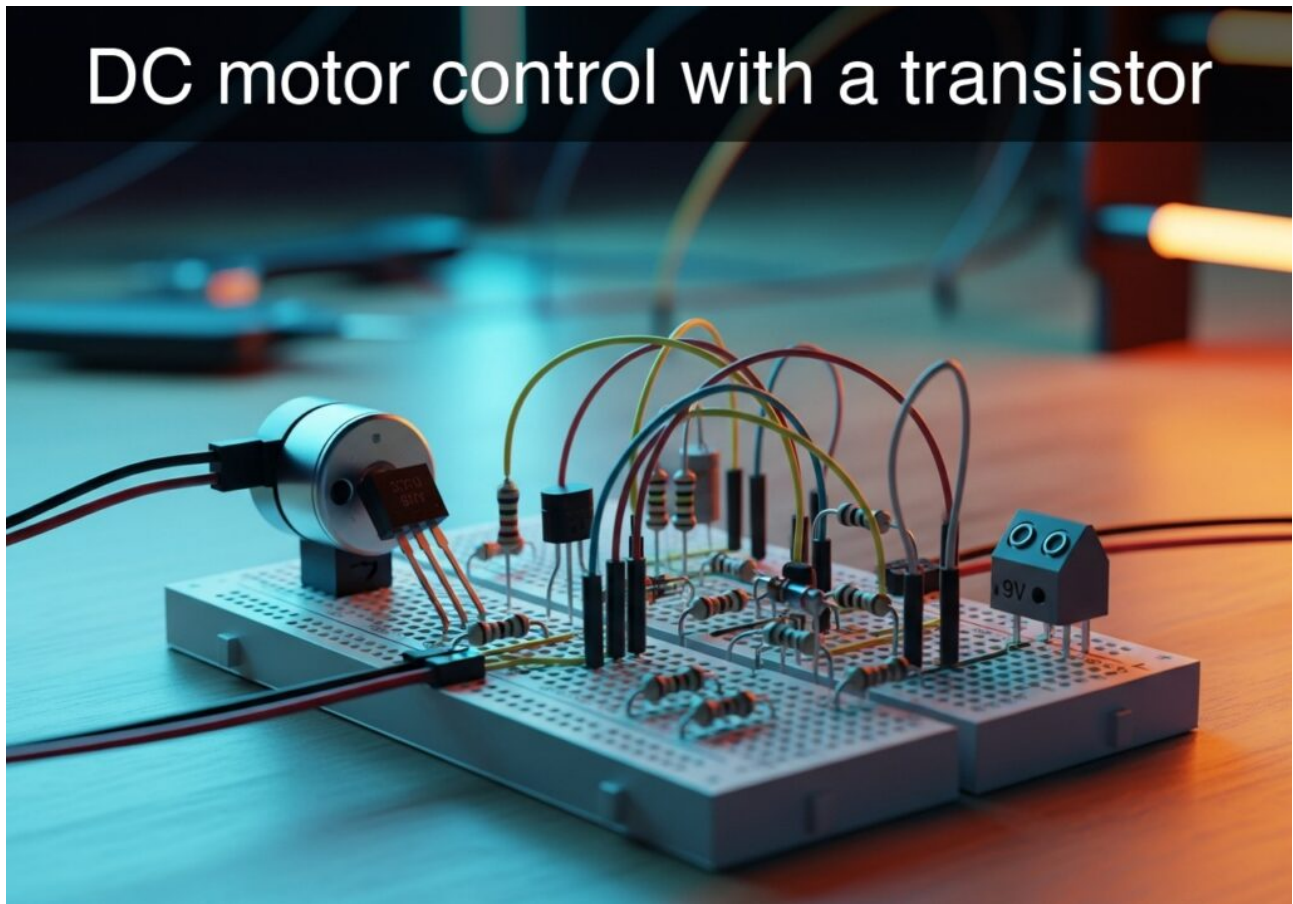


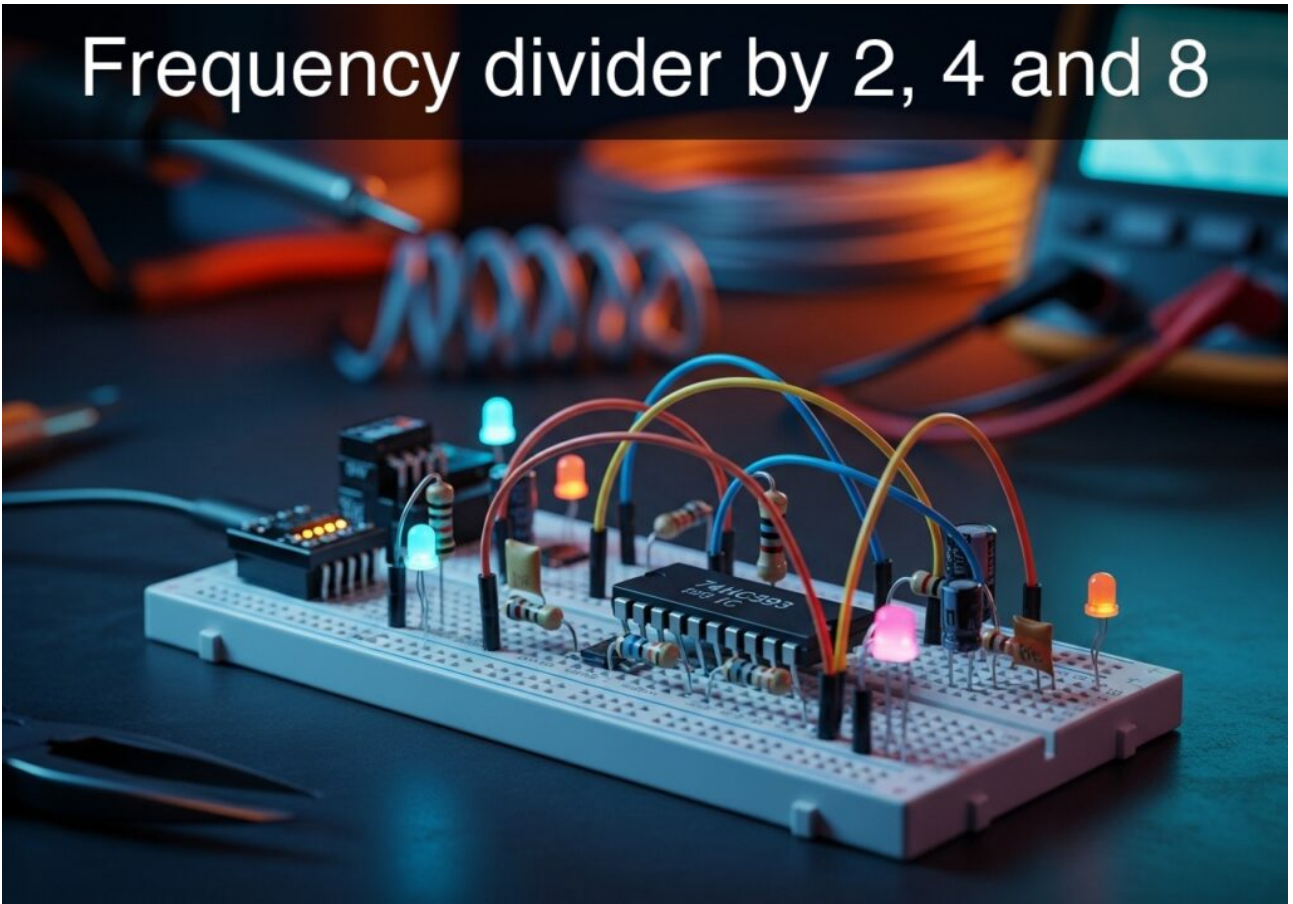
Practical case: DC motor control with a transistor



Level: Basic – Learn to use an NPN transistor as a switch to drive a DC motor, including the use of a flyback diode.

Practical case: Frequency divider by 2, 4 and 8

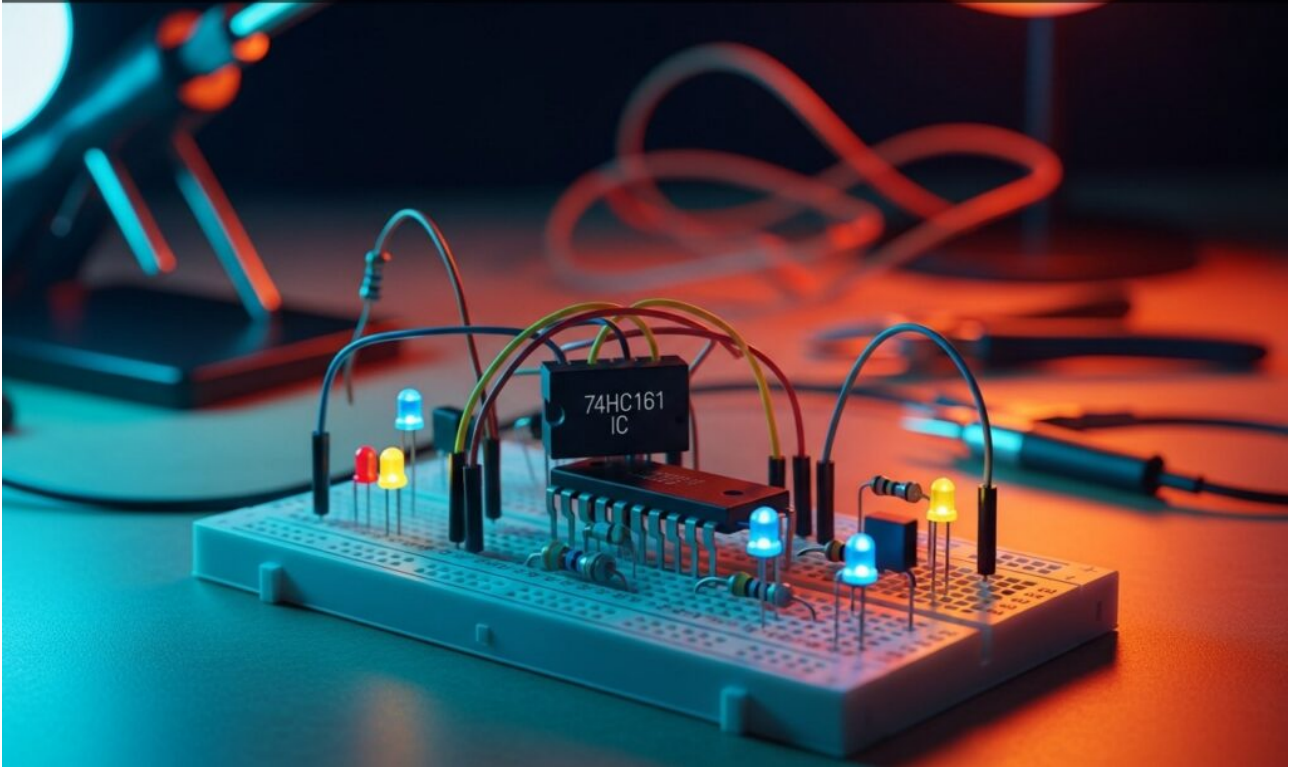
Frequency divider by 2, 4 and 8



In this Digital Electronics lab, use a Binary counter to build a frequency divider. Verify square wave outputs at $f/2$, $f/4$, and $f/8$ relative to the clock.

Practical case: 4-bit up counter with LEDs

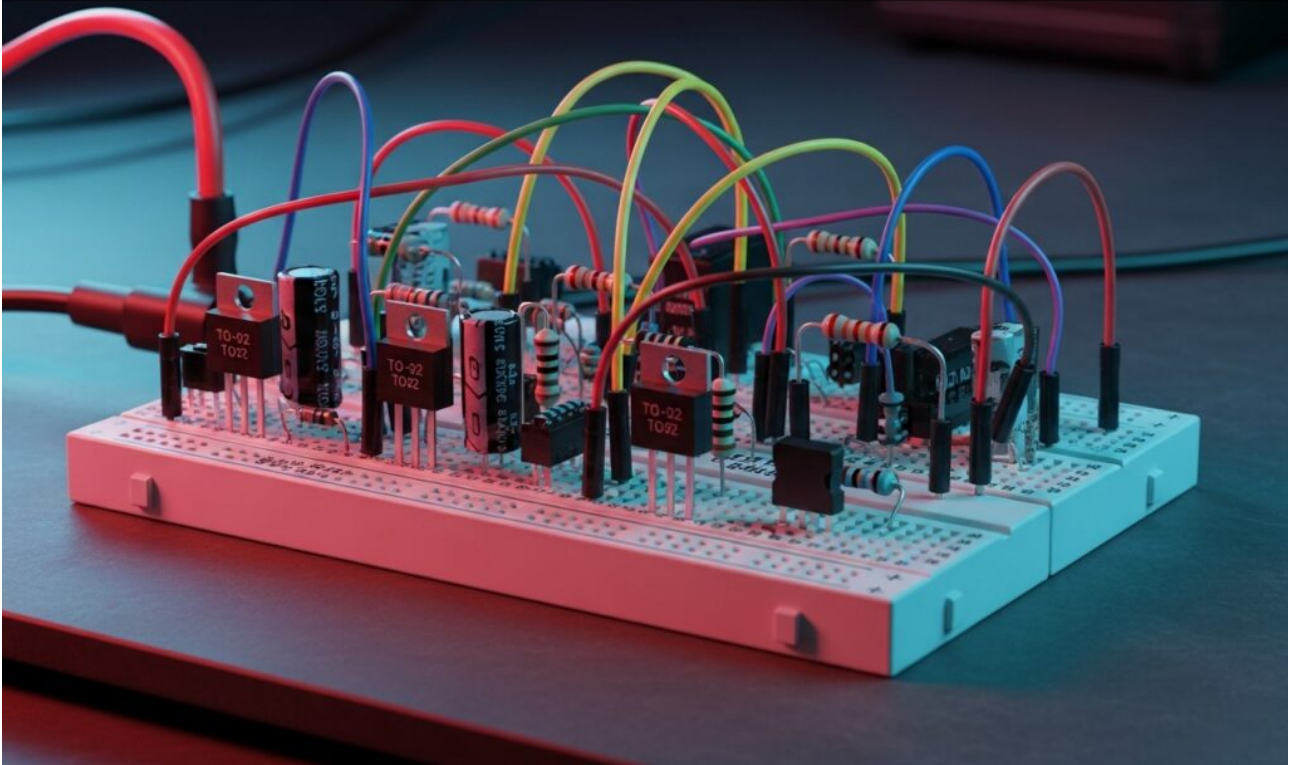
4-bit up counter with LEDs



Build a practical Digital Electronics circuit with a Binary counter. Visualize the 0 to 15 sequence on LEDs and verify synchronous clock signals.

Practical case: Vault Lock with Delay and Power Drive

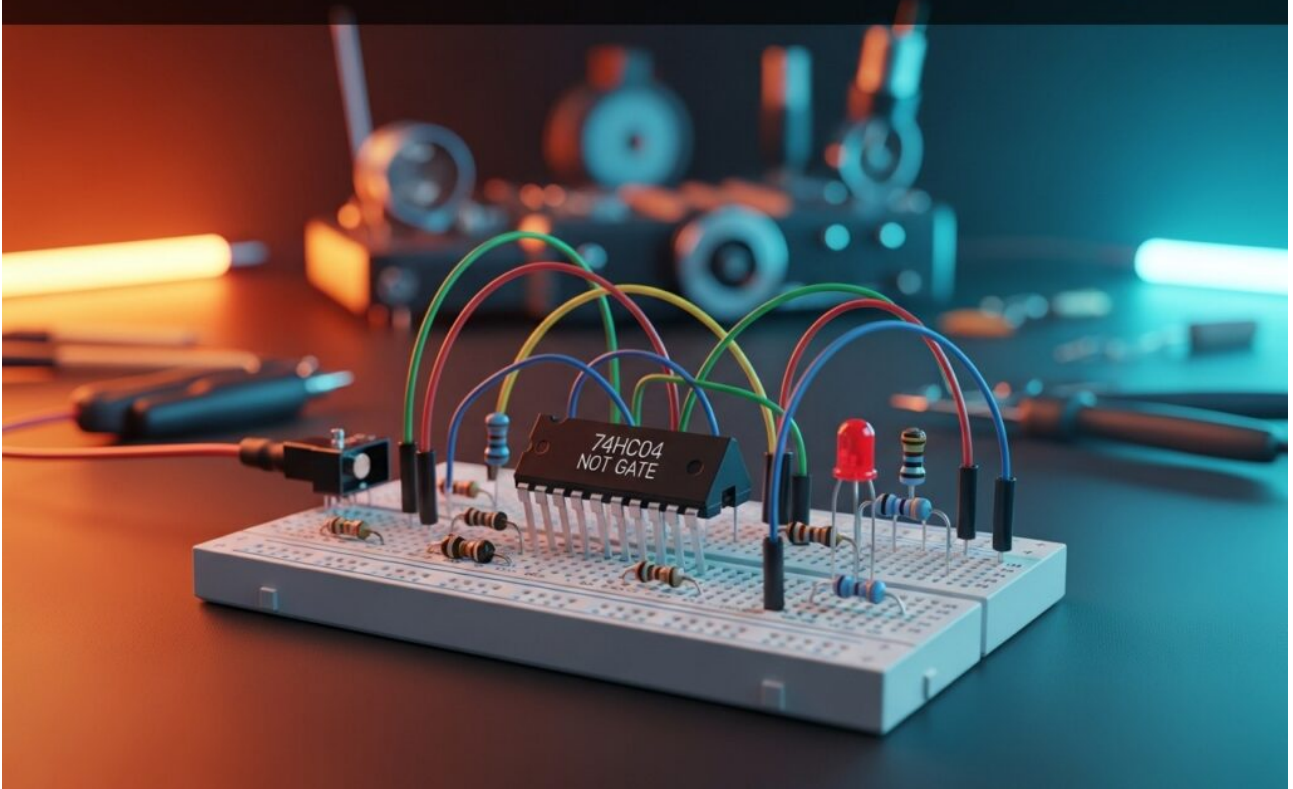
Vault Lock with Delay and Power Drive



Master Analog Electronics by building a secure lock. Use a Transistor circuit to trigger a solenoid only when two keys turn, holding the signal for 5 seconds.

Practical case: The Undefined Logic Level Danger

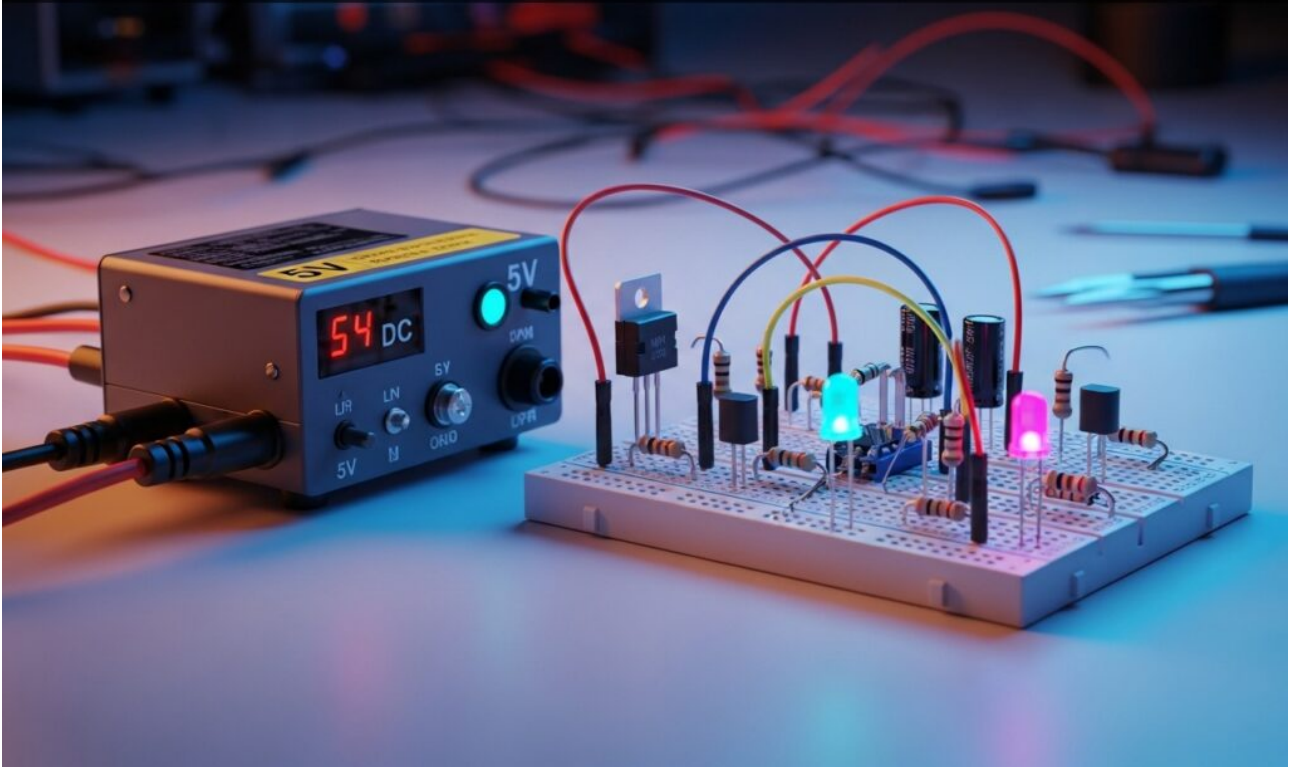
The Undefined Logic Level Danger



Master Analog Electronics by analyzing unstable logic states. Learn how internal Transistor behavior causes shoot-through current and flickering LED outputs.

Practical case: NPN Switch Saturation Troubleshooting

NPN Switch Saturation Troubleshooting



Master Analog Electronics by fixing a flawed NPN Transistor switch. Diagnose dim LEDs and high V_{ce} voltage, then correct bias to achieve full saturation.