Voltmeter with ATtiny85 and LCD using 74HC595

Objective:
Build a compact digital voltmeter using ATtiny85 and a standard character LCD, controlled via a 74HC595 shift register to minimize I/O pin usage.

Components Required:

- ATtiny85 microcontroller

- 16x2 LCD display

- 74HC595 shift register

- Voltage divider circuit (using 2 resistors)

- Breadboard & jumper wires

- Power supply (e.g., 5V)

Circuit Overview:

- The LCD is controlled through a **74HC595 shift register**, allowing it to run using just **3 digital pins** from ATtiny85.

- A **voltage divider** is used to bring higher voltages down to the ATtiny85's safe analog input range (0–5V).

- The LCD displays the measured voltage in real time.

Working Principle:

- The voltage divider feeds the scaled input voltage to one of ATtiny85's analog input pins.

- The ATtiny85 reads the voltage using its built-in ADC and calculates the actual voltage value.

- The **74HC595** receives serial data from ATtiny85 and drives the LCD to show the result.

- This method saves I/O pins, allowing full LCD control with only 3 wires.

Use Cases:

- Compact digital voltmeter

- Battery monitoring system

- DIY multimeter or power supply display

Note:

Make sure to calibrate the voltage divider accurately and update the calculation formula based on resistor values.