Connections

1. **Power Supply:**
    - The circuit is powered via a **USB connection**, providing a **regulated 5V**.
    - **GND** is shared across all components.
2. **ATtiny85 Microcontroller:**
    - Reads the voltage input using an **Analog-to-Digital Converter (ADC)**.
    - Controls a **74HC595 shift register** to drive the **7-segment displays**.
3. **74HC595 Shift Register:**
    - Converts the **serial data** from ATtiny85 into **parallel output** for the **4-digit 7-segment display**.
    - The data lines are connected to the corresponding segment pins.
4. **7-Segment Display (4-Digit, Multiplexed):**
    - **Segment pins** are connected to the **74HC595 shift register**.
    - **Common cathodes** are controlled by ATtiny85 to enable **digit multiplexing**.
5. **Voltage Measurement Circuit:**

- A **potentiometer** is used to vary the input voltage for testing.
- The voltage is fed into the **ADC pin of ATtiny85**, which converts it to a digital value.

Working Principle

1. **Voltage Sensing:**
   - The ATtiny85 reads the analog input voltage via its **ADC**.
   - It converts the analog voltage to a **digital value** using the formula:
     V=(ADC_Value/1023)×5VV = (ADC_Value / 1023) \times 5VV=(ADC_Value/1023)×5V
2. **Data Processing:**
   - The microcontroller **scales the voltage** appropriately for display.
   - The voltage value is **split into individual digits** for the 7-segment display.
3. **Displaying on 7-Segment:**
   - The **74HC595 shift register** receives serial data from ATtiny85 and outputs it in parallel.
   - The **7-segment display is multiplexed**, meaning each digit is quickly switched on and off in succession to create a stable visual output.

- The ATtiny85 ensures each digit is activated at the correct time.

4. **Refreshing Display:**

   - The display refreshes every **4 milliseconds**, ensuring smooth visualization of voltage values.

   - The `millis()` function helps update the display without blocking other tasks.