// PROJECT  :LCDAnalogMeter2223

// PURPOSE  :Early ICS3U Introduction to LCD Display of Sensor Data (Potentiometer)

// DEVICE   :Arduino + (Adafruit 1447) LCD Appliance + Potentiometer

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// DATE     :2023 02 26

// uC       :328p

// COURSE   :ICS3U

// STATUS   :Working

// REFERENCE:https://www.arduino.cc/en/Reference/LiquidCrystal

// REFERENCE:https://www.arduino.cc/en/Tutorial/HelloWorld

// REFERENCE:http://darcy.rsgc.on.ca/ACES/TEI3M/2223/images/LCDAnalogMeter2223.png

#include <**LiquidCrystal**.h>        //LCD Library...

#define LCD\_COLUMNS 16            //Number of columns in Character LCD screen

#define LCD\_ROWS    2             //Number of rows on LCD screen

//define a custom character to be used for the display

// REFERENCE:https://www.arduino.cc/en/Reference/LiquidCrystalCreateChar

uint8\_t midBlock[8] = {0, 0, 0x1F, 0x1F, 0x1F, 0x1F, 0, 0};

//Pin assignments below are LCD Appliance-compatible

uint8\_t EN = 9, RS = 8, D4 = 7, D5 = 6, D6 = 5, D7 = 4;

**LiquidCrystal** lcd(RS, EN, D4, D5, D6, D7);

void setup() {

  **Serial**.begin(9600);

  lcd.begin(LCD\_COLUMNS, LCD\_ROWS); //initialize LCD screen

  lcd.clear();                      //erase the LCD screen

  lcd.setCursor(0, 0);              //position display cursor at home

  lcd.print("Adjust your pot");     //provide an instruction on the first line

  lcd.createChar(0, midBlock);      //register custom character in HD44780 EEPROM

}

void loop() {

  uint16\_t reading = analogRead(A5); //obtain sensor (pot) reading

  uint8\_t value = map(reading, 0, 1023, 0, LCD\_COLUMNS);  //scale it for display

  **Serial**.print(reading);

  **Serial**.println("\t" + String(value));

  lcd.setCursor(0, 1);    //position LCD cursor at the start of the second row

  for (uint8\_t i = 0; i <= value; i++)

    lcd.write(255); //http://darcy.rsgc.on.ca/ACES/Datasheets/HD44780.pdf#page=17

  //lcd.write(byte(0));   //or, first custom character (midBlock in this case)

  delay(200);             //admire...

  lcd.setCursor(0, 1);    //prepare to erase the second row

  lcd.print("                    ");  //do it...

}