PSEUDO CODE FOR STM32 NUCLEO

// Initialization Method for Precision Dispensing System
// Initialize components
FUNCTION Initialize_System():

   // Set up peristaltic pump
   Configure Pump to Default State // Ensure the pump is off initially
   Set Pump Direction to Forward using relay circuit // Prepare for initialising using Relay for polarity switching such that the direction of flow for forward dispensing

   // Configure load cell and amplifier (HX711)
   Initialize Load_Cell // Power on the load cell
   Calibrate Load_Cell with HX711 // Perform calibration to zero out initial weight
   Set Load_Cell_Thresholds (Red_Solution_Target, Blue_Solution_Target) // Define target weights for solutions
   Tare Load_Cell // Set initial weight as zero for accurate dispensing

   // Initialize display
   Initialize OLED_Display // Set up I2C communication for OLED

   // Set up servo-driven pinch valves
   Set Servo_Pinch1 // pinch valve for red solution
   Set Servo_Pinch2 // pinch valve for blue solution

   // Configure servo motor for outlet switching
   Initialize Servo motor // Set up the motor for outlet switching
   Set servo to either of the containers // Position at the starting location for dispensing

   // Configure cycle and delay timing variables
   Set Cycle_Count to 0 // Initialize cycle count to track dispensing cycles
   Set Reverse_Pump_Delay to 30-40 seconds // Set time delay for reversing the pump after dispensing

END FUNCTION

// Start process loop for 5 cycles

FOR cycle = 1 TO 5 DO

   // Dispense red solution
   Activate Servo_Pinch1 // Open pinch valve for red solution
   Select Outlet1 // Direct output to container for red solution
   Start Pump // Begin dispensing using Relay for polarity switching such that the direction of flow changes

   // Continuously read load sensor and update display

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    WHILE Load_Cell_Reading < Red_Solution_Target DO
       Display Load_Cell_Reading on OLED
    END WHILE

    Stop Pump  // As the target weight for red solution reached.
    Reverse Pump  // Move any residual solution back to red reservoir using relay module to
change the polarity of pump
    Delay 30-40 seconds  // Allow time for residual solution to clear

    Deactivate Servo_Pinch1  // Close pinch valve for red solution

    // Dispense blue solution
    Activate Servo_Pinch2  // Open pinch valve for blue solution
    Select Outlet2  // Direct output to container for blue solution
    Start Pump  // Begin dispensing

    // Continuously read load sensor and update display
    WHILE Load_Cell_Reading < Blue_Solution_Target DO
       Display Load_Cell_Reading on OLED
    END WHILE

    Stop Pump  // Target weight for blue solution reached
    Reverse Pump  // Move any residual solution back to blue reservoir
    Delay 30-40 seconds  // Allow time for residual solution to clear

    Deactivate Servo_Pinch2  // Close pinch valve for blue solution

END FOR

// End of cycle loop
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