Class-3, Class Program LCD

```c
19
20    #define _XTAL_FREQ 20000000  // Define the crystal oscillator frequency as 20MHz (for delay func
21
22    void Lcdinit(void);        // Function prototype for LCD initialization
23    void LcdCommand(uint8_t);  // Function prototype for sending commands to the LCD
24    void LcdData(uint8_t);     // Function prototype for sending data to the LCD
25
26    uint8_t x, i, m;           // Declare global variables
27
28    uint8_t a[18] = {"HELLO WORLD"}; // Character array storing the message to display
29
30    void main(void) {
31        Lcdinit();  // Initialize the LCD
32
33        // Loop to display "HELLO WORLD" on the LCD
34        for (int i = 0; i < 11; i++) {
35            LcdCommand(0x80 + i);  // Move the cursor to the respective position on the LCD (startin
36            LcdData(a[i]);          // Send each character to the LCD
37        }
38
39        while(1);  // Infinite loop to keep the program running
40    }

43    void Lcdinit(void) {
44        TRISC = 0x00;  // Set PORTC as output (for control signals)
45        TRISD = 0x00;  // Set PORTD as output (for data signals)
46
47        __delay_ms(100);  // Wait for LCD to stabilize
48
49        // LCD initialization sequence as per the HD44780 LCD datasheet
50        LcdCommand(0x30);  // Send function set command (8-bit mode)
51        __delay_ms(100);   // Delay for command execution
52        LcdCommand(0x30);  // Repeat function set command
53        __delay_ms(100);
54        LcdCommand(0x30);  // Repeat function set command again
55        __delay_ms(100);
56        LcdCommand(0x38);  // Set LCD for 8-bit mode, 2-line display, 5x8 font
57        __delay_ms(100);
58        LcdCommand(0x0C);  // Turn on display, cursor off
59        __delay_ms(100);
60        LcdCommand(0x01);  // Clear the display
61        __delay_ms(100);
62    }
64    // Function to send data (characters) to the LCD
65    void LcdData(uint8_t i) {
66        PORTC |= (0x1 << 3);  // Set RS (RC3) = 1 (indicates data mode)
67        PORTD = i;            // Place data on PORTD
68        PORTC |= (0x1 << 0);  // Set EN (RC0) = 1 (enable pulse start)
69        __delay_ms(100);      // Small delay for command execution
70        PORTC &= ~(0x1 << 0); // Set EN (RC0) = 0 (enable pulse end)
71    }
72
73    // Function to send commands to the LCD
74    void LcdCommand(uint8_t i) {
75        PORTC &= ~(0x1 << 3);  // Set RS (RC3) = 0 (indicates command mode)
76        PORTD = i;             // Place command on PORTD
77        PORTC |= (0x1 << 0);   // Set EN (RC0) = 1 (enable pulse start)
78        __delay_ms(100);       // Small delay for command execution
79        PORTC &= ~(0x1 << 0);  // Set EN (RC0) = 0 (enable pulse end)
80    }
```