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// ************************************* header.h ***********************************
// Project: Keil Labs and Project
// File: header.h
// Class: ENEL 351 Lab Works
// Programmer: Amandip Padda
// SID: 200455829
// Description: The project is based on the STM32F103RB that is being used in ENEL 351 Labs.
// It will also be used in the Project related to input and output of various sensors.

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// ********************************** Header Files **********************************
#include <stdint.h>

// ********************************* LCD Port Addresses *****************************
#define LCD_8B2L        0x38            //              ; Enable 8 bit data, 2 display lines
#define LCD_DCB             0x0F            //              ; Enable Display, Cursor, Blink
#define LCD_MCR             0x06            //              ; Set Move Cursor Right
#define LCD_CLR             0X01            //              ; Home and clear LCD
#define LCD_LN1             0X80            //              ;       Set DDRAM to start of line 1
#define LCD_LN2             0XC0            //              ; Set DDRAM to start of line 2
#define LCD_FLD2        0X8C            //              ; Set DDRAM to 13th position on line 1
#define LCD_FLD4        0XCC            //              ; Set DDRAM to 13th position on line 2

// ****** Control signal manipulation for LCDs on 352/384/387 board PB0:RS PB1:ENA PB5:R/W ******
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#define LCD_CM_ENA    0X00210002
#define LCD_CM_DIS    0x00230000
#define LCD_DM_ENA    0x00200003
#define LCD_DM_DIS    0x00220001

// ************* A delay function used for delaying the processor to a certain speed ************
void delay(int);

// ******************************** Configuration of clocks ******************************
void clockInit(void);

// ********************** Enabling certain ports like IO / AFIO / ADC ***********************
void portEnable(void);

// ************************** Configuring certain pins on the ports ***************************
void pinConfigure(void);

// ********************************** Read Pressure Sensor ********************************
int readPressure(void);

// ****************************** Read Photo Resistor Sensor ******************************
int readPhotoResistor(void);

// ******************************* Instructions to run it all *****************************
void led_sequence_all(void);

// ************************** Instructions to run 1st LED Sequence ************************
void led_sequence1(void);
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// ************************* Instructions to run 2nd LED Sequence ************************
void led_sequence2(void);

// ************************* Instructions to run 3rd LED Sequence ************************
void led_sequence3(void);

// ************************* Instructions to run 4th LED Sequence ************************
void led_sequence4(void);

// ***************************** Instructions to run USER LED ****************************
void ledTest(void);

// ***************************** Instructions to stop USER LED ****************************
void stopLedTest(void);

// ************************** Instructions to move left forward **************************
void leftForward();

// ************************* Instructions to move left backward **************************
void leftReverse(void);

// ******************************* Instructions to stop left ******************************
void leftStop(void);

// ************************** Instructions to move right forward **************************
void rightForward(void);

// ************************* Instructions to move right backward **************************
void rightReverse(void);
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// ****************************** Instructions to stop right ******************************
void rightStop(void);

// ************************* Instructions to run all wheels forward ***************************
void completeGoForward();

// ***************************** Instructions to stop all wheels ******************************
void completeStop(void);

// ******************************** Instructions to clear LCD *********************************
void lcdClear(void);

// *************************** Instructions to control Brightness ***************************
void brightnessControl(int);

// ******************************** Instructions to setup LCD *********************************
void lcdSetup(void);

// ************************** Instructions to send commands to LCD ****************************
void commandToLCD(uint8_t);

// ************************** Instructions to send string to LCD ****************************
void stringToLCD(char *);

// ************************** Instructions to send data to LCD ****************************
void dataToLCD(uint8_t);

// ************************** Instructions to clear second line ****************************
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void field2(void);


// ************************* Instructions to clear fourth line ******************************

void field4(void);


// ************************* Instructions to clear the whole LCD *****************************

void clear(void);


// ************************* Initial Instructions to run on LCD ******************************

void powerScreen(void);


// ***************** Instructions to Calculate Distance using Ultra Sonic Sensor ****************

float calculateDistance();


// ******************* Timer for Ultra Sonic Sensor to help calculate distance ******************

void timerDelay(uint32_t);


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