```
// ************************************** lcd.c ************************************
// Project: Keil Labs and Project
// File: lcd.c
// 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 "stm32f10x.h"
#include "header.h"
#include <string.h>

// ********************************** LCD setup ************************************
void lcdSetup(void)
{
        commandToLCD(LCD_8B2L);
        commandToLCD(0x0C);
        commandToLCD(0x06);
        commandToLCD(0x01);
}
```

```
// ********************************** Push Commands to LCD ****************************
void commandToLCD(uint8_t data)
{
	GPIOB->BSRR = LCD_CM_ENA; //RS low, E high
	GPIOC->ODR &= 0xFF00;
	GPIOC->ODR |= data;
	delay(150);
	GPIOB->BSRR = LCD_CM_DIS; //RS low, E high
	delay(150);
}

// ********************************** Push Data to LCD ******************************
void dataToLCD(uint8_t data)
{
	GPIOB->BSRR = LCD_DM_ENA; //RS low, E high
	GPIOC->ODR &= 0xFF00;
	GPIOC->ODR |= data;
	delay(150);
	GPIOB->BSRR = LCD_DM_DIS; //RS low, E high
	delay(150);
}

// ************************************ String to LCD *********************************
void stringToLCD(char *message)
{
	int i = 0;
  uint16_t messageLength = strlen(message);
  for (i = 0; i < messageLength; ++i)
  {
```

```
                dataToLCD(message[i]);
        }
}

// ******************************** Clearing the 2nd line *********************************
void field2(void)
{
        commandToLCD(LCD_FLD2);
        dataToLCD(0x20);
        dataToLCD(0x20);
        dataToLCD(0x20);
        dataToLCD(0x20);
        commandToLCD(LCD_FLD2);
}

// ******************************** Clearing the 4th line *********************************
void field4(void)
{
        commandToLCD(LCD_FLD4);
        dataToLCD(0x20);
        dataToLCD(0x20);
        dataToLCD(0x20);
        dataToLCD(0x20);
        commandToLCD(LCD_FLD4);
}

// ********************************** Clearing LCD ************************************
void clear()
{
```

```
	commandToLCD(LCD_CLR);
}

// ****************************** Initial Setup on LCD ***********************************
void powerScreen()
{
	brightnessControl((readPhotoResistor()*(100.00/4095.00)));
	stringToLCD("    SNACK");
	commandToLCD(LCD_LN2);
	stringToLCD("  DISTRIBUTOR");
	delay(1500);
	commandToLCD(LCD_CLR);
	delay(1500);
	stringToLCD("    SNACK");
	commandToLCD(LCD_LN2);
	stringToLCD("  DISTRIBUTOR");
	delay(1500);
	commandToLCD(LCD_CLR);
	stringToLCD("   Get Ready!");
	delay(1500);
	commandToLCD(LCD_CLR);
	stringToLCD("  Power it On!");
	delay(3000);
	commandToLCD(LCD_CLR);
	completeGoForward();
}

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// ==