KLE TECHNOLOGICAL UNIVERSITY
Creating Value, Leveraging Knowledge
Belagavi Campus
DR. M. S. SHESHGIRI COLLEGE OF ENGINEERING AND TECHNOLOGY

Department of Electronics and Communication Engineering

RTOS Lab Review Report

Group-14

TEAM MEMBERS:

Basagouda Patil 02FE21BEC016

Ekata Honnegundi 02FE21BEC033

Neela Saloni 02FE21BEC051

Rakshita Kusanale 02FE21BEC069

Problem Statement:

Write a C Program to Interface LCD and IR Sensor using LPC1768 Cortex M Board.

Code:

```
#include <lpc17xx.h>
#include "lcd.h"
unsigned long int temp1 = 0, temp2 = 0;
unsigned char Msg1[15] = {"Detected"};
unsigned char Msg2[19] = {"Not Detected"};
int main(void) {
   SystemInit();
   SystemCoreClockUpdate();
   lcd_init();
   lcd_init(); // initialise LCD
   delay_lcd(3200);
   while (1) {
      clr_disp();
      if (ObjectDetected()) {
         temp1 = 0x80;
         lcd_com();
         delay_lcd(3200);
         lcd_puts(Msg1);
      } else {
         temp1 = 0x80;
         lcd_com();
         delay_lcd(3200);
```

```
            lcd_puts(Msg2);
          }
       }
       while (1);
}
void lcd_init()
{
   LPC_PINCON->PINSEL3 &= 0xFFFF00FF;
                LPC_PINCON->PINSEL7 &= 0XFFF3FFFF;
   LPC_PINCON->PINSEL7 &= 0xFFCFFFFF;
                LPC_PINCON->PINSEL9 &= 0xFCFFFFFF;
   LPC_GPIO1->FIODIR |= DT_CTRL;
                    LPC_GPIO3->FIODIR |= RS_CTRL;
   LPC_GPIO3->FIODIR |= RW_CTRL;
                    LPC_GPIO4->FIODIR |= EN_CTRL;

   clear_ports();
                              delay_lcd(3200);

                                temp2=0x30;
                                  wr_cn();
                              delay_lcd(30000);

                                temp2=0x30;
                                  wr_cn();
                              delay_lcd(30000);
```

```
temp2=0x30;
wr_cn();
delay_lcd(30000);

temp2=0x20;
wr_cn();
delay_lcd(30000);

temp1 = 0x28;
lcd_com();
delay_lcd(30000);

temp1 = 0x0c;
lcd_com();
delay_lcd(800);

temp1 = 0x06;
lcd_com();
delay_lcd(800);

temp1 = 0x01;
lcd_com();
delay_lcd(10000);

temp1 = 0x80;
lcd_com();
delay_lcd(800);
```

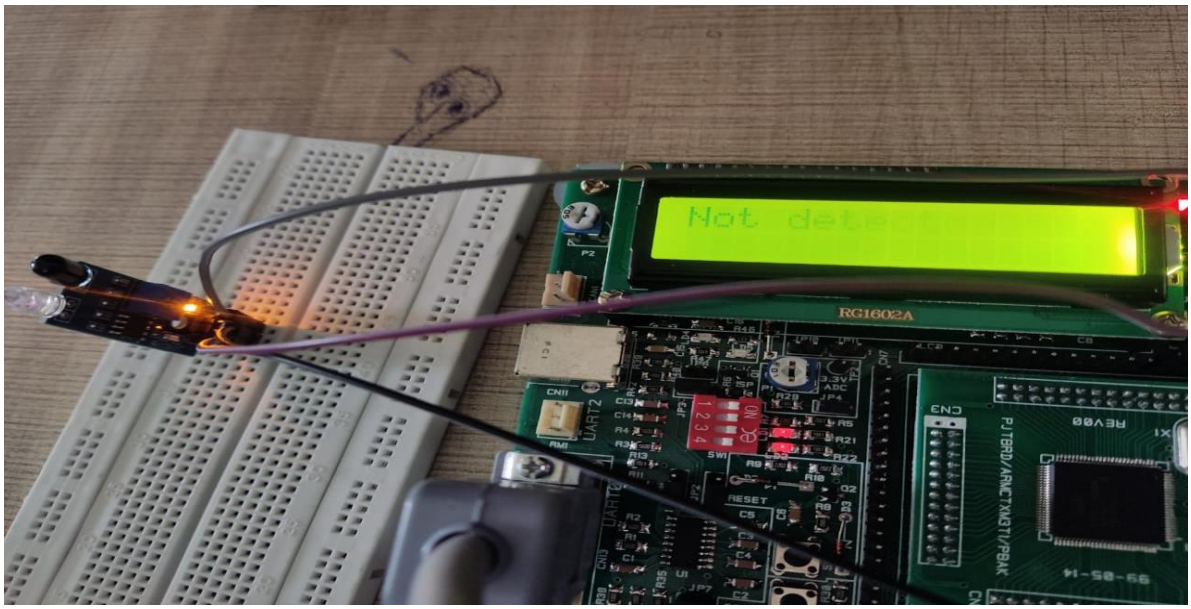
```
   return;
}
void lcd_com(void)
{
                        temp2= temp1 & 0xf0;
                        temp2 = temp2 << 16;
                                wr_cn();
                        temp2 = temp1 & 0x0f;
                        temp2 = temp2 << 20;
                                wr_cn();
                            delay_lcd(1000);
   return;
}
void wr_cn(void)
{
                                clear_ports();
                      LPC_GPIO1->FIOPIN = temp2;
                    LPC_GPIO3->FIOCLR = RW_CTRL;
   LPC_GPIO3->FIOCLR = RS_CTRL;
                     LPC_GPIO4->FIOSET = EN_CTRL;
                                delay_lcd(25);
                    LPC_GPIO4->FIOCLR  = EN_CTRL;
   return;

 }

 void lcd_data(void)
```

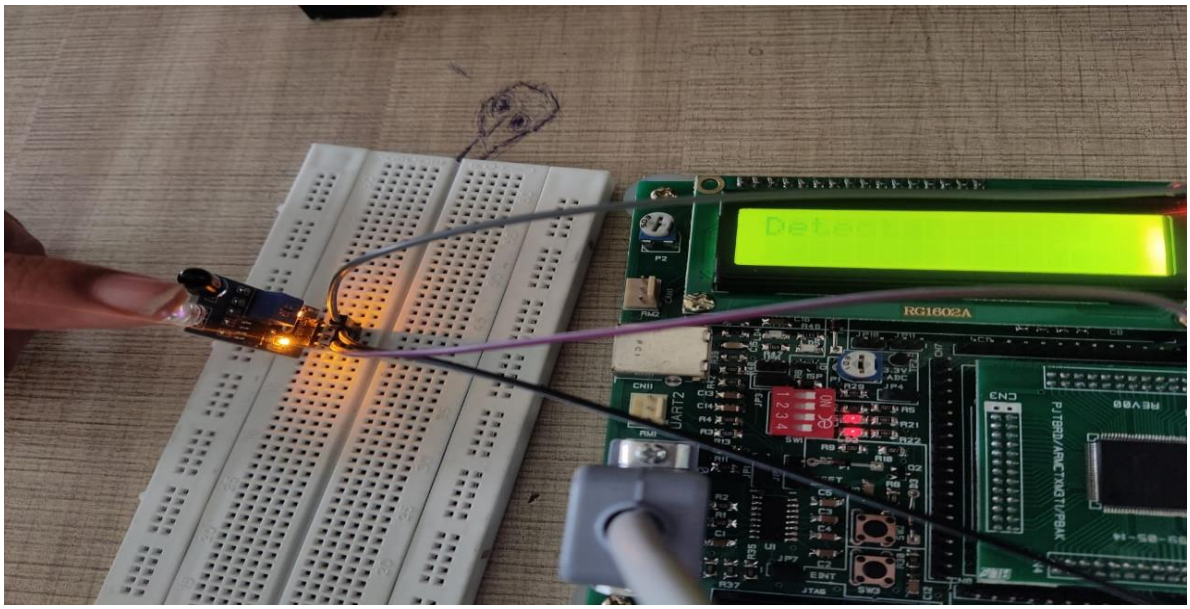
```
{
   temp2 = temp1 & 0xf0;
   temp2 = temp2 << 16;
   wr_dn();
   temp2= temp1 & 0x0f;
   temp2= temp2 << 20;
   wr_dn();
   delay_lcd(1000);
   return;
}
void wr_dn(void)
{
                              clear_ports();

                       LPC_GPIO1->FIOPIN = temp2;
                      LPC_GPIO3->FIOSET = RS_CTRL;
                     LPC_GPIO3->FIOCLR = RW_CTRL;
                      LPC_GPIO4->FIOSET = EN_CTRL;
                                delay_lcd(25);
                     LPC_GPIO4->FIOCLR  = EN_CTRL;
   return;
 }
void delay_lcd(unsigned int r1)
{
                               unsigned int r;
                             for(r=0;r<r1;r++);
   return;
```

```
}

void clr_disp(void)
{
                                temp1 = 0x01;
                                  lcd_com();
                               delay_lcd(10000);
   return;
}
void clear_ports(void)
{

                    LPC_GPIO1->FIOCLR = DT_CTRL;
                    LPC_GPIO3->FIOCLR = RS_CTRL;
   LPC_GPIO3->FIOCLR = RW_CTRL;
                    LPC_GPIO4->FIOCLR = EN_CTRL;

   return;
}
void lcd_puts(unsigned char *buf1)
{
   unsigned int i=0;
   while(buf1[i]!='\0')
   {
      temp1 = buf1[i];
                                  lcd_data();
                                          i++;
```

```
        if(i==16)
                                                {
                                        temp1 = 0xc0;
                                                        lcd_com();
                                                }
       }
    return;
}
int ObjectDetected() {
    return (LPC_GPIO0->FIOPIN & (1 << 0)) ? 0 : 1;
}
```

Implementation and Output:




RG1602A
UART2