Experiment 14

Aim:

Write a program in C language to operate the

LCD

LEDs

7 Segment display

Stepper Motor

Tool Used: Keil uVision4

CODE: LCD

```
#include <LPC214x.h>
#define DATA_PORT_SET       IOSET1
#define DATA_PORT_CLR       IOCLR1
#define DATA_DIR            IODIR1
#define D7                  23
#define D6                  22
#define D5                  21
#define D4                  20
#define D3                  19
#define D2                  18
#define D1                  17
#define D0                  16
//Set data port pins
#define DATA_PORT (unsigned
long)((1<<D7)|(1<<D6)|(1<<D5)|(1<<D4))|((1<<D3)|(1<<D2)|(1<<D1)|(1<<D0))

#define CTRL_PORT_SET       IOSET1
#define CTRL_PORT_CLR       IOCLR1
#define CTRL_DIR            IODIR1
#define CTRL_RS             24
#define CTRL_EN             25

#include"delay.h"
#include"lcd.h"
int main()
{
 int i;
init_lcd();

   while(1)
   {
    cmd_lcd(0x80);
    string_lcd("PRATIBHA SINGH ");
    cmd_lcd(0xc0);
    string_lcd("  602162015  ");

        for(i=0;i<5;i++)
        {
        cmd_lcd(0x1C);
        delay_ms(1000);
        }
        for(i=0;i<5;i++)
        {
        cmd_lcd(0x18);
        delay_ms(1000);
```

```
            }
        }
    }
```

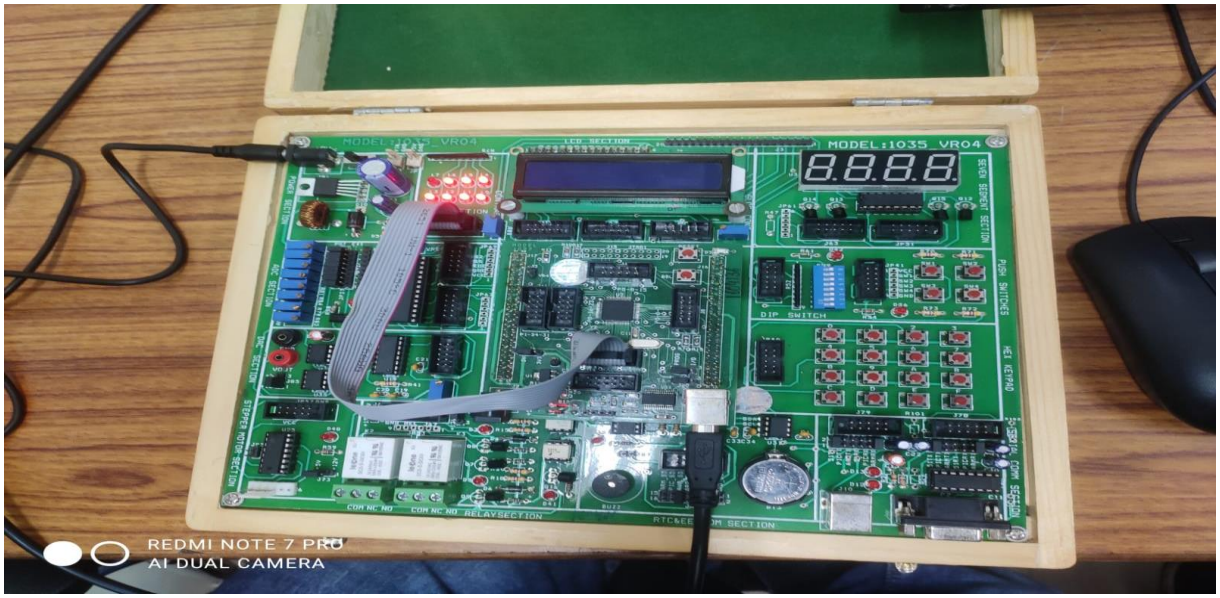
OBSERVATION:

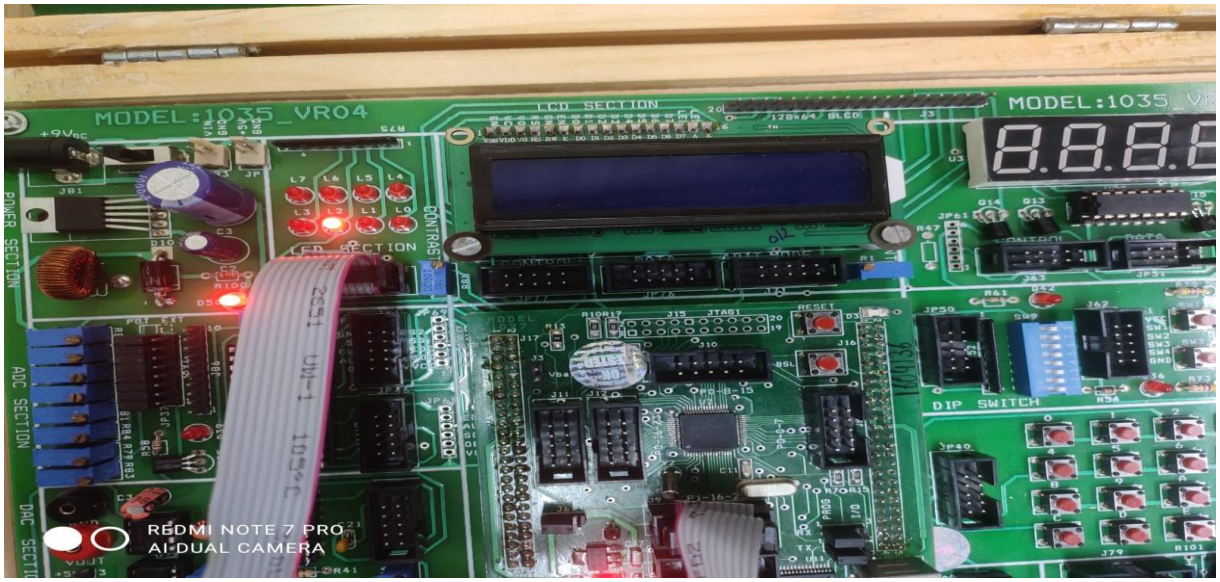
CODE: LEDs

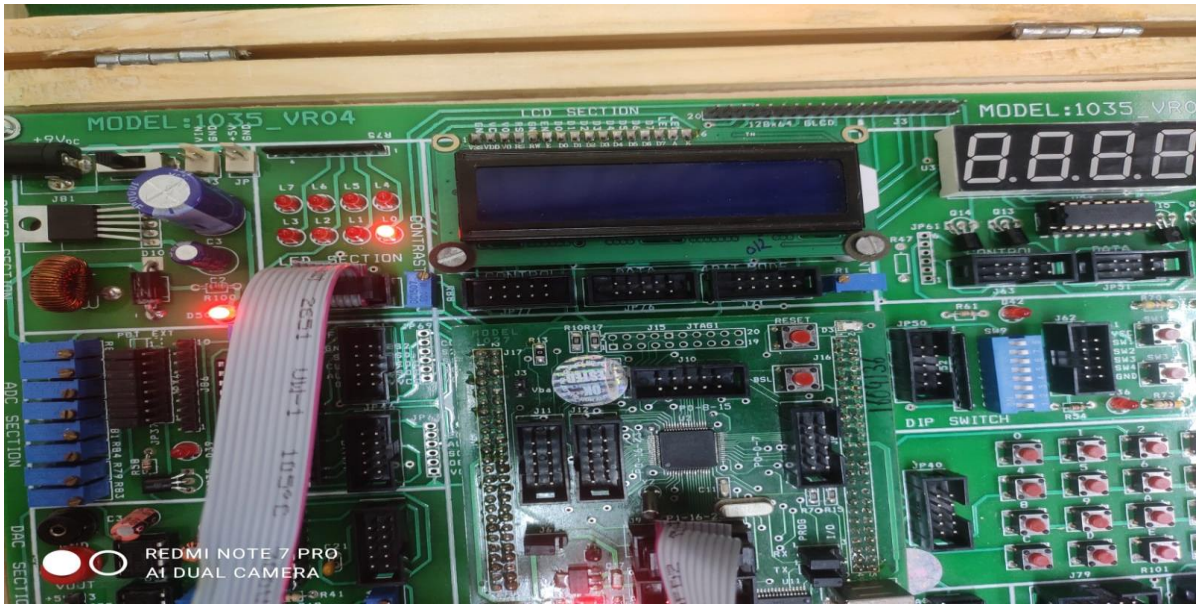
```
#include <LPC214x.h>
#include"delay.h"
#define LED_SET             IOSET1
#define LED_CLR           IOCLR1
#define LED_DIR            IODIR1
#define LED_PIN             IOPIN1

#define LED7                23
#define LED6                        22
#define LED5                21
#define LED4                20
#define LED3                19
#define LED2                18
#define LED1                17
#define LED0                16
//Set data port pins
#define LED_PORT                    (unsigned
long)((1<<LED7)|(1<<LED6)|(1<<LED5)|(1<<LED4))|((1<<LED3)|(1<<LED2)|(1<<LED1
)|(1<<LED0))

int i,a,b,x,y;

int main()
{
    LED_DIR |= (unsigned long)(LED_PORT);       //initialize D0:D7 pins as
output
    LED_CLR |= (unsigned long)(LED_PORT);       //initialize D0:D7 pins as
output
```

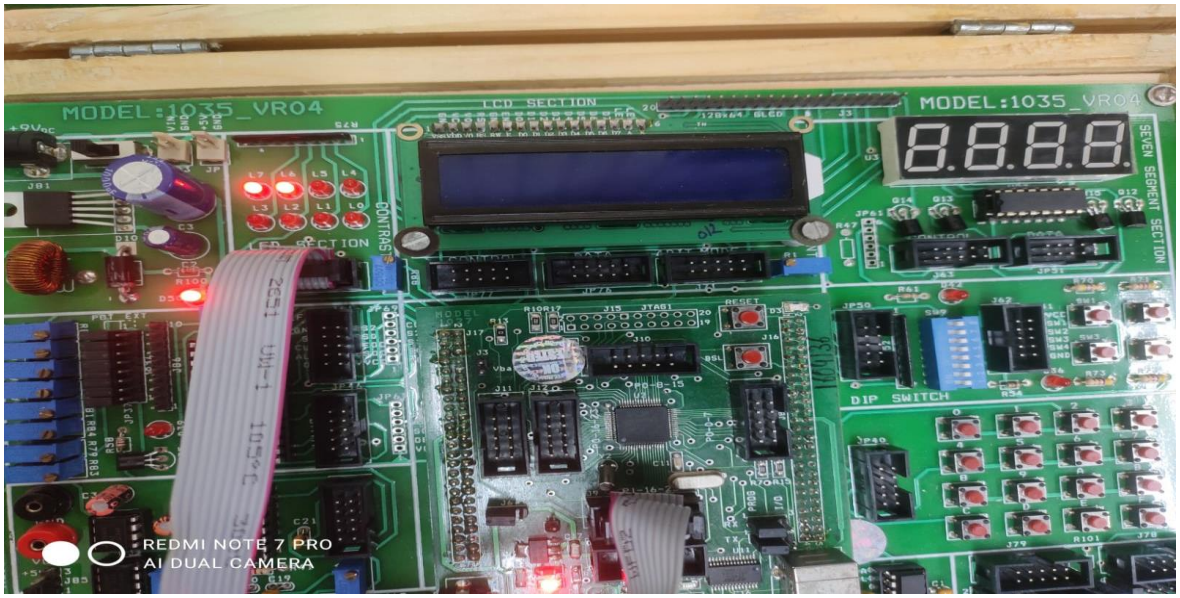
```
    while(1)
    {
    ////////// nibble on off
        LED_CLR |= (0xf0) << LED0;
        LED_SET |= (0x0f) << LED0;
    delay_ms(500);
        LED_CLR |= (0x0f) << LED0;
        LED_SET |=  (0xf0) << LED0;
        delay_ms(500);
    /// odd even on off
        LED_CLR |= (0xff) << LED0;
        LED_SET |= (0xaa) << LED0;
    delay_ms(500);
        LED_CLR |= (0xff) << LED0;
        LED_SET |= (0x55) << LED0;
    delay_ms(500);
    //////// left shift
        LED_PIN = (0x01) << LED0;
    delay_ms(500);
        for(i=0;i<7;i++)
        {
            LED_PIN = LED_PIN << 1;
            delay_ms(500);
    }
    ////////// rotate left
        LED_PIN = (0x01) << LED0;
    delay_ms(500);
        for(i=0;i<7;i++)
        {
            LED_PIN = LED_PIN << 1 | (0x01 << LED0);
            delay_ms(500);
    }
    ////////////    right shift
        LED_PIN = (0x80) << LED0;
        delay_ms(500);

        for(i=0;i<7;i++)
        {
            LED_PIN = (LED_PIN >> 1) & (0X7F << LED0);
            delay_ms(500);
    }
    ////////// rotate right
        LED_PIN = (0x80) << LED0;
    delay_ms(500);

        for(i=0;i<7;i++)
        {
            LED_PIN = (LED_PIN >> 1);
            delay_ms(500);
    }
  }
}
```

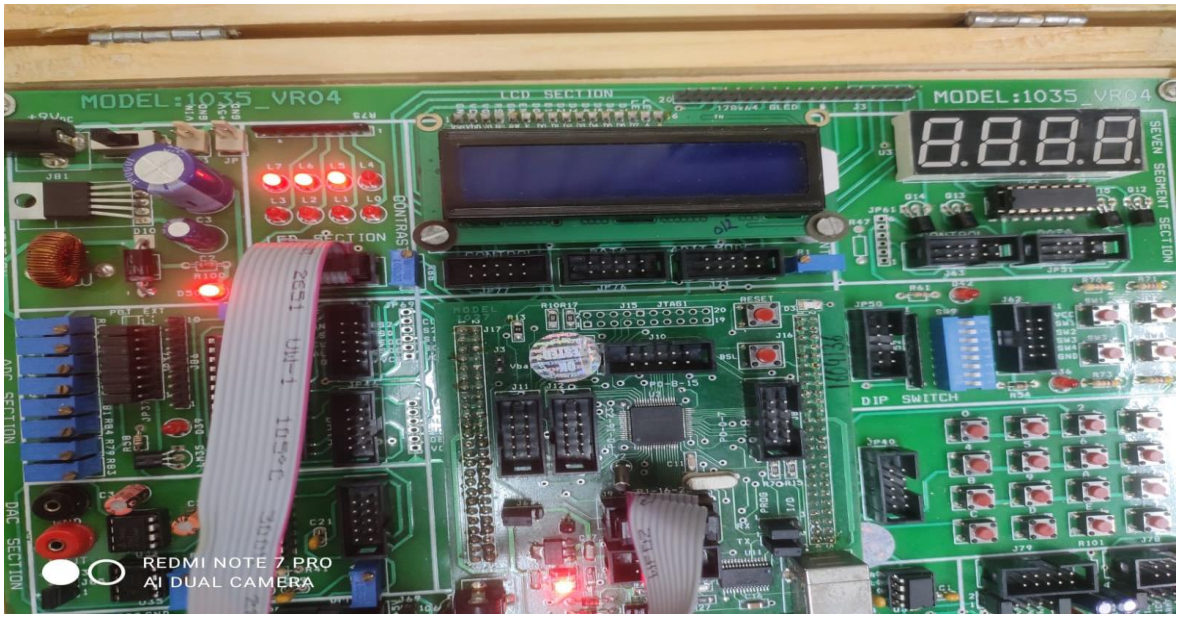
OBSERVATION

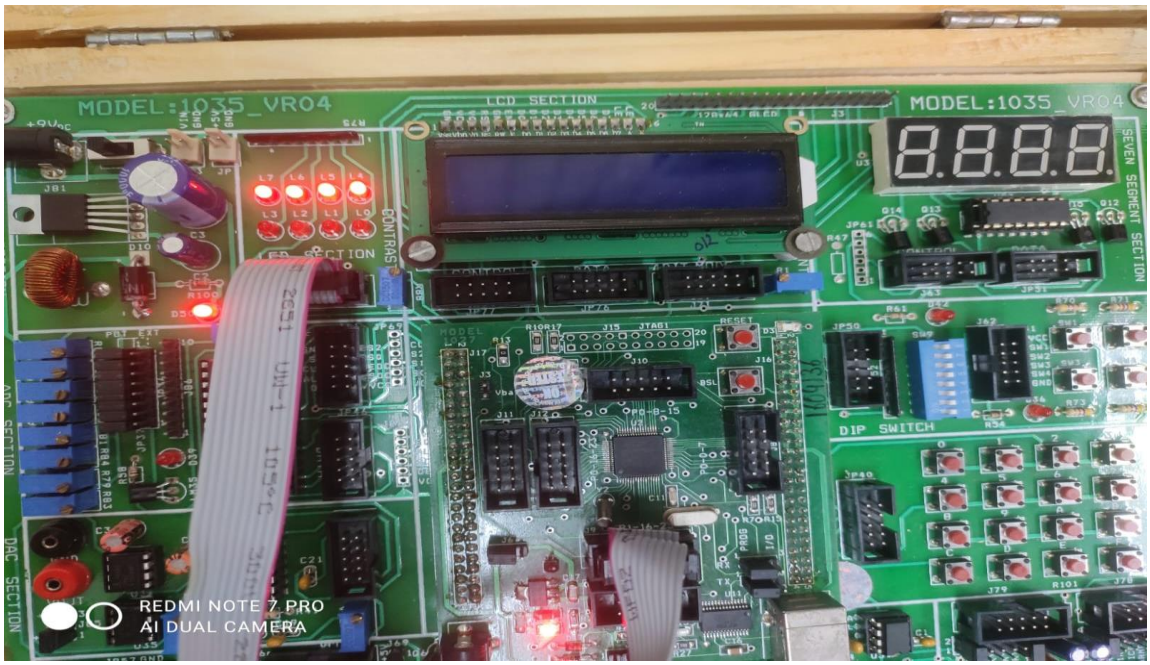

MODEL:1035_VR04
REDMI NOTE 7 PRO
AI DUAL CAMERA

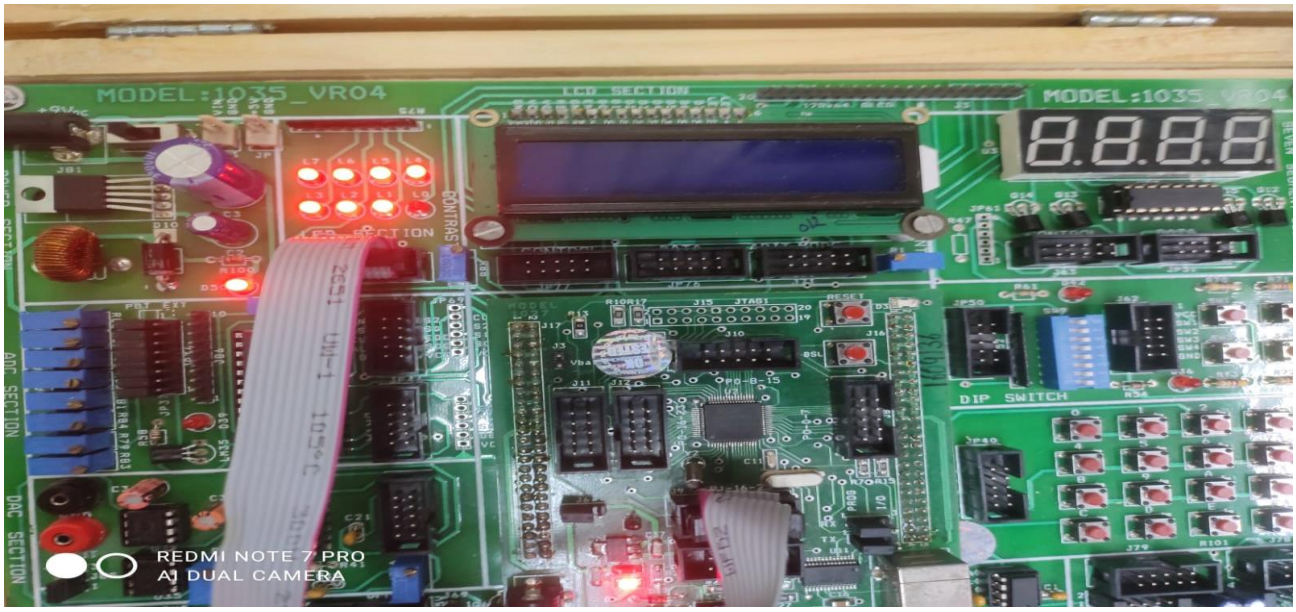

MODEL:1035_VR04
LCD SECTION
DIP SWITCH
POWER SECTION
ADC SECTION
DAC SECTION
REDMI NOTE 7 PRO
AI DUAL CAMERA


MODEL:1035_VR04
LCD SECTION
DIP SWITCH
POWER SECTION
ADC SECTION
DAC SECTION
REDMI NOTE 7 PRO
AI DUAL CAMERA


MODEL:1035_VR04
LCD SECTION
SEVEN SEGMENT SECTION
DIP SWITCH
REDMI NOTE 7 PRO
AI DUAL CAMERA


MODEL:1035_VR04
LCD SECTION
SEVEN SEGMENT SECTION
DIP SWITCH
ADC SECTION
DAC SECTION
REDMI NOTE 7 PRO
AI DUAL CAMERA


MODEL:1035_VR04
LCD SECTION
SEVEN SEGMENT SECTION
DIP SWITCH
ADC SECTION
DAC SECTION
REDMI NOTE 7 PRO
AI DUAL CAMERA



CODE: 7 Segment Display

```
#include"lpc214x.h"
#include"delay.h"

int main()
{
int a,b,c,d,e;
unsigned char arr[] = {0xbf, 0x86, 0xdb, 0xcf, 0xe6, 0xed, 0xfd, 0x87, 0xff,
0xef};
IODIR0 = 0xffffffff;
while(1)
 {
for(a=0;a<=9;a++)
 {
  for(b=0;b<=9;b++)
  {
    for(c=0;c<=9;c++)
    {
      for(d=0;d<=9;d++)
      {
        for(e=0;e<=50;e++)
        {
              IOCLR0 = 0xFFFFFFFF;
              IOSET0 = arr[d]<<16 |
0x0100;
    delay_ms(2);
              IOCLR0 = 0xFFFFFFFF;
              IOSET0 = arr[c]<<16 |
0x0200;
    delay_ms(2);
              IOCLR0 = 0xFFFFFFFF;
              IOSET0 = arr[b]<<16 |
0x0400;
    delay_ms(2);
              IOCLR0 = 0xFFFFFFFF;
              IOSET0 = arr[a]<<16 |
0x0800;
    delay_ms(2);
        }
      }
     }
    }
  }
}
}
```

CODE: Stepper Motor

```
#include"lpc214x.h"
#include"delay.h"

#define m1                  16
#define m2                  17
#define PORT_SET        IOSET1
#define PORT_CLR        IOCLR1
#define DIR             IODIR1

int main()
{
DIR |= (1<<m1)|(1<<m2);
PORT_CLR = (1<<m1) | (1<<m2);
while(1)
```

```
{
        PORT_CLR = (1<<m1) | (1<<m2);
        PORT_SET = (1<<m1);
        delay_ms(4000);
        PORT_CLR = (1<<m1) | (1<<m2);
        delay_ms(1000);
```

```
        PORT_CLR = (1<<m1) | (1<<m2);
        PORT_SET = (1<<m2);
        delay_ms(4000);
        PORT_CLR = (1<<m1) | (1<<m2);
        delay_ms(1000);
}
}
```

RESULT:

The C codes Written above have been implemented and verified successfully.