CHAPTER: 1 LED

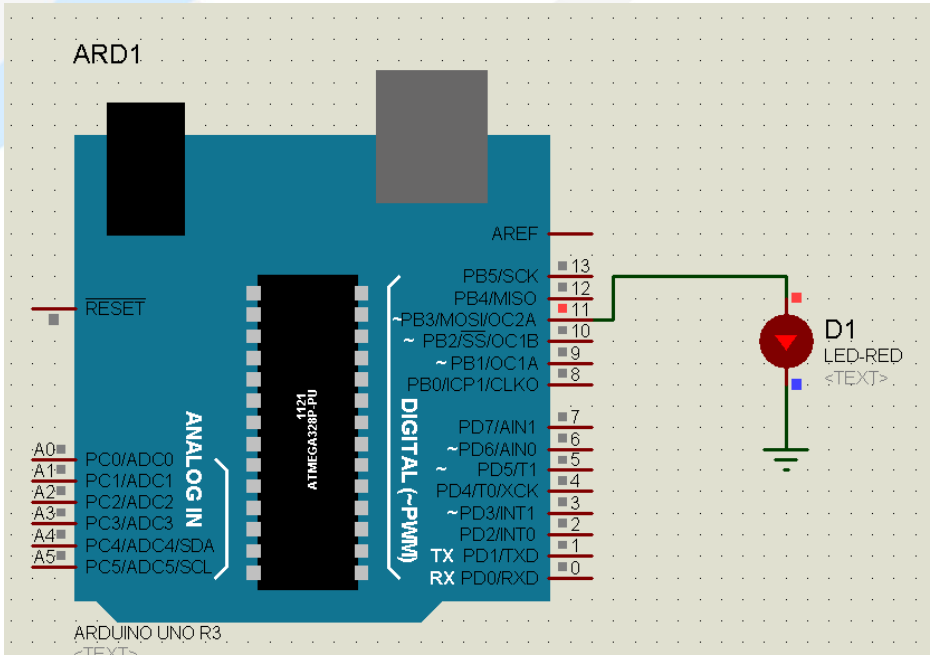
PRACTICAL: 1A

AIM: To Flash/toggle/on off single LED.

ARDUINO CODE:

```
/***********************
 * Author: Shreejicharan
 * Title: Flash/toggle/on off single LED.
 * Date: 27/05/2017
 * Time: 6:00
 * Email: shreejicharanelectronics@gmail.com
 ***********************/

#define led 11
void setup()
{
  pinMode(led,OUTPUT);
}
void loop()
{
    digitalWrite(led,HIGH);
    delay(500);
    digitalWrite(led,LOW);
    delay(500);
}
```

SIMULATION:



CHAPTER: 2 RELAY

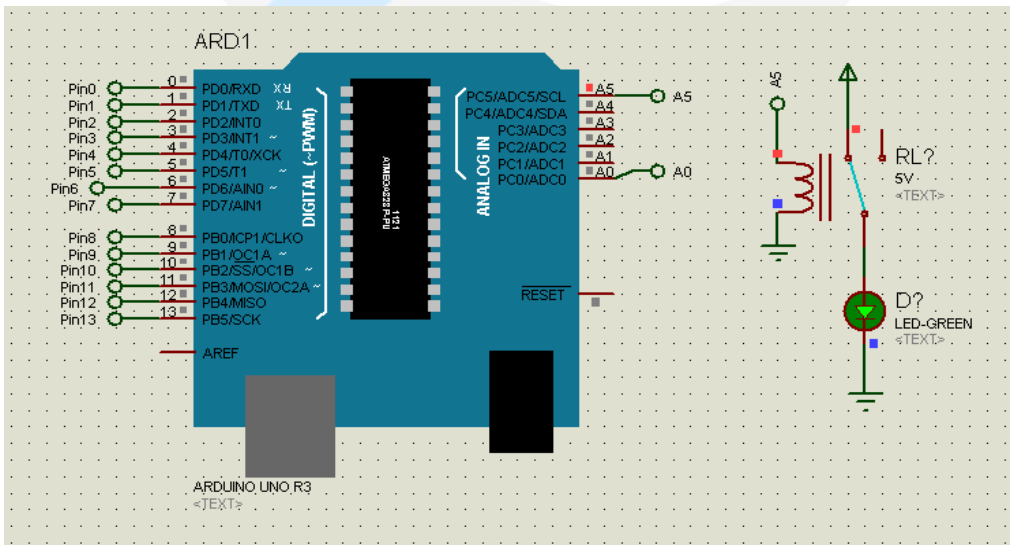
PRACTICAL: 2A

AIM: To Flash LED by using relay.

ARDUINO CODE:

```
/***********************
 * Author: Shreejicharan
 * Title: Flash/toggle/on off single LED.
 * Date: 27/05/2017
 * Time: 6:00
 * Email: shreejicharanelectronics@gmail.com
 ***********************/
#define RELAY  A5
void setup()
{
        pinMode(RELAY, OUTPUT);
}
void loop()
{
        digitalWrite(RELAY,HIGH);          // Turns Relay On
         delay(500);
        digitalWrite(RELAY,LOW);          // Turns Relay Off
         delay(500);
}
```

SIMULATION:



CHAPTER: 3 LCD

PRACTICAL: 3A

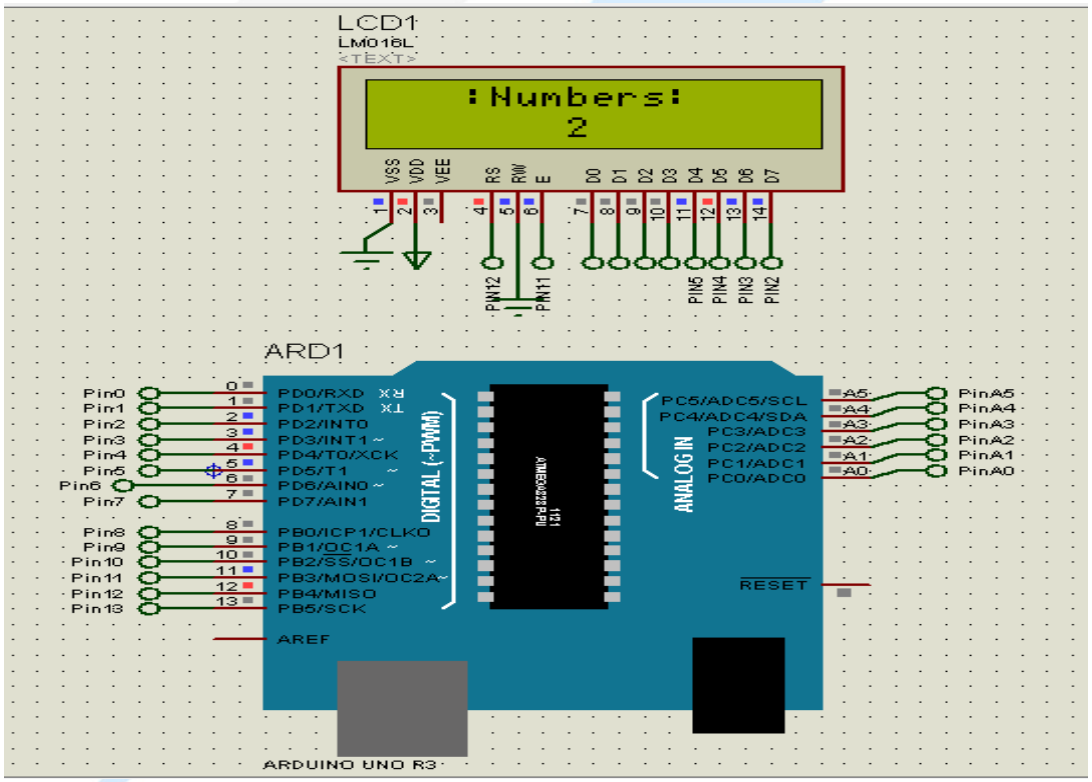
AIM: To interface the LCD using Arduino.

ARDUINO CODE:

```
/**********************
 * Author: Shreejicharan
 * Title: To interface the LCD using Arduino.
 * Date: 27/05/2017
 * Time: 6:00
 * Email: shreejicharanelectronics@gmail.com
 **********************/

/*
 The circuit:
 * LCD RS pin to digital pin 12
 * LCD Enable pin to digital pin 11
 * LCD D4 pin to digital pin 5
 * LCD D5 pin to digital pin 4
 * LCD D6 pin to digital pin 3
 * LCD D7 pin to digital pin 2
 * LCD R/W pin to ground
 */

// include the library code:
#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
  // set up the lcd's number of columns and rows:
  lcd.begin(16, 2);
}
```

```
void loop() {
  lcd.setCursor(0,0);
  lcd.print("Numbers: ");

  for(int i=0; i<10; i++){
    lcd.setCursor(4,1);
    lcd.print(i);    // requires integer as input -- don't use char
    delay(500);
  }
}
```

SIMULATION:



CHAPTER: 4 KEYPAD

PRACTICAL: 4A

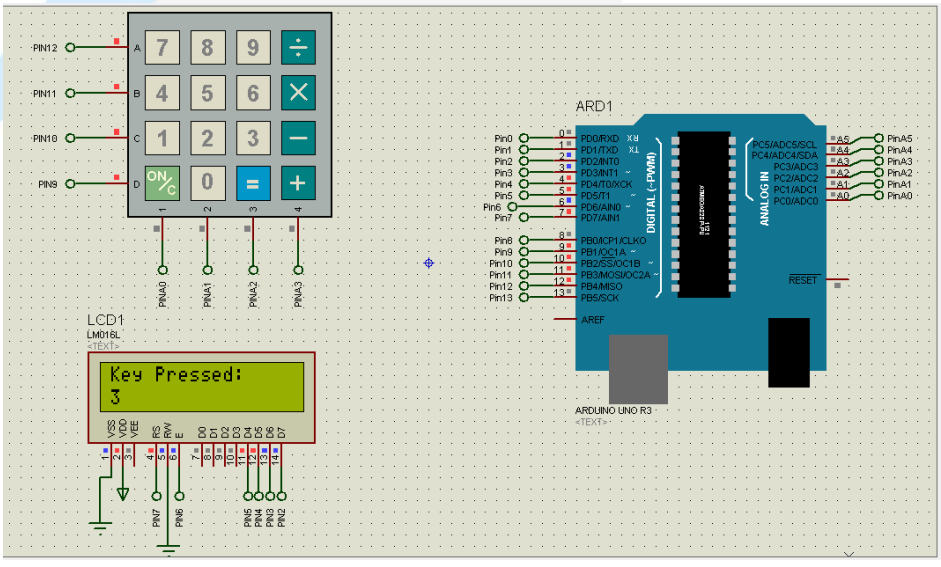
AIM: To interface the KEYPAD using Arduino.

ARDUINO CODE:

```
/**********************
 * Author: Shreejicharan
 * Title: To interface the KEYPAD using Arduino.
 * Date: 27/05/2017
 * Time: 6:00
 * Email: shreejicharanelectronics@gmail.com
 **********************/

 The circuit:
 * LCD RS pin to digital pin 7
 * LCD Enable pin to digital pin 6
 * LCD D4 pin to digital pin 5
 * LCD D5 pin to digital pin 4
 * LCD D6 pin to digital pin 3
 * LCD D7 pin to digital pin 2
 * LCD R/W pin to ground
 */

// include the library code:
#include <LiquidCrystal.h>
#include <Keypad.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);

const byte ROWS = 4; //four rows
const byte COLS = 4; //four columns
```

```
//define the symbols on the buttons of the keypads
char hexaKeys[ROWS][COLS] =
{
                    {    '7','8','9','%'   },
                    {    '4','5','6','x'    },
                    {    '1','2','3','-'    },
                    {    'C','0','=','+'    }
};

byte rowPins[ROWS] = {  12, 11, 10, 9}; //connect to the row pinouts of the keypad
byte colPins[COLS] = { A0, A1, A2, A3}; //connect to the column pinouts of the keypad

//initialize an instance of class NewKeypad
Keypad customKeypad = Keypad( makeKeymap(hexaKeys), rowPins, colPins, ROWS,
COLS);

void setup(){
  // set up the lcd's number of columns and rows:
  lcd.begin(16,2);
  lcd.print("Key Pressed:");
}
void loop(){
  char customKey = customKeypad.getKey();
  if (customKey){
    // set the cursor to the top row, 0th Coumn, 1st Row:
    lcd.setCursor(0, 1);
    // draw the arrow
    lcd.write(customKey);
    delay(300);
  }
}
```

SIMULATION:



CHAPTER: 5 SEVEN SEGMENT

PRACTICAL: 5A

AIM: To interface SEVEN SEGMENT using Arduino.

ARDUINO CODE:

```
/**********************
 * Author: Shreejicharan
 * Title: To interface SEVEN SEGMENT using Arduino.
 * Date: 27/05/2017
 * Time: 6:00
 * Email: shreejicharanelectronics@gmail.com
 **********************/
void setup(){
  for(int i=0;i<10;i++){
    pinMode(i,OUTPUT);
  }
}

void loop(){
  char num[]={
    0xC0,0xF9,0xA4,0xB0,0x99,0x92,0x82,0xF8,0x80,0x90  };
  for(int i=0; i<10; i++){
    PORTD = num[i];
    delay(200);
  }
}
```

SIMULATION: