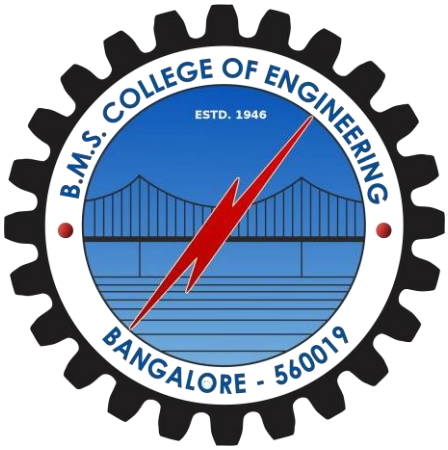
IOT LAB MANUAL-2020

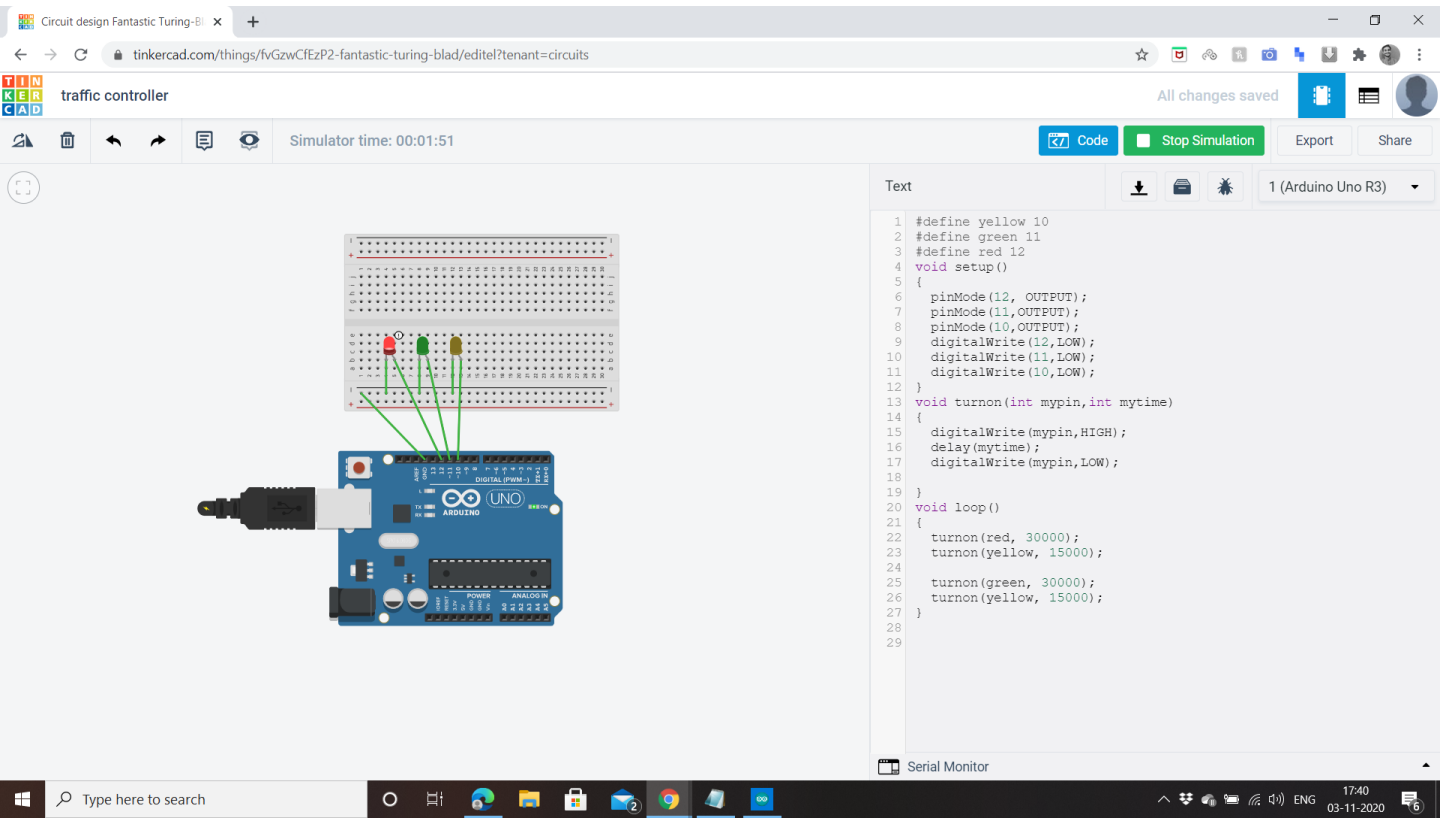


Name: Shivam Vaish
USN: 1BM18CS152

CONSOLIDATED LAB PROGRAMS

Index:

1. Traffic Light



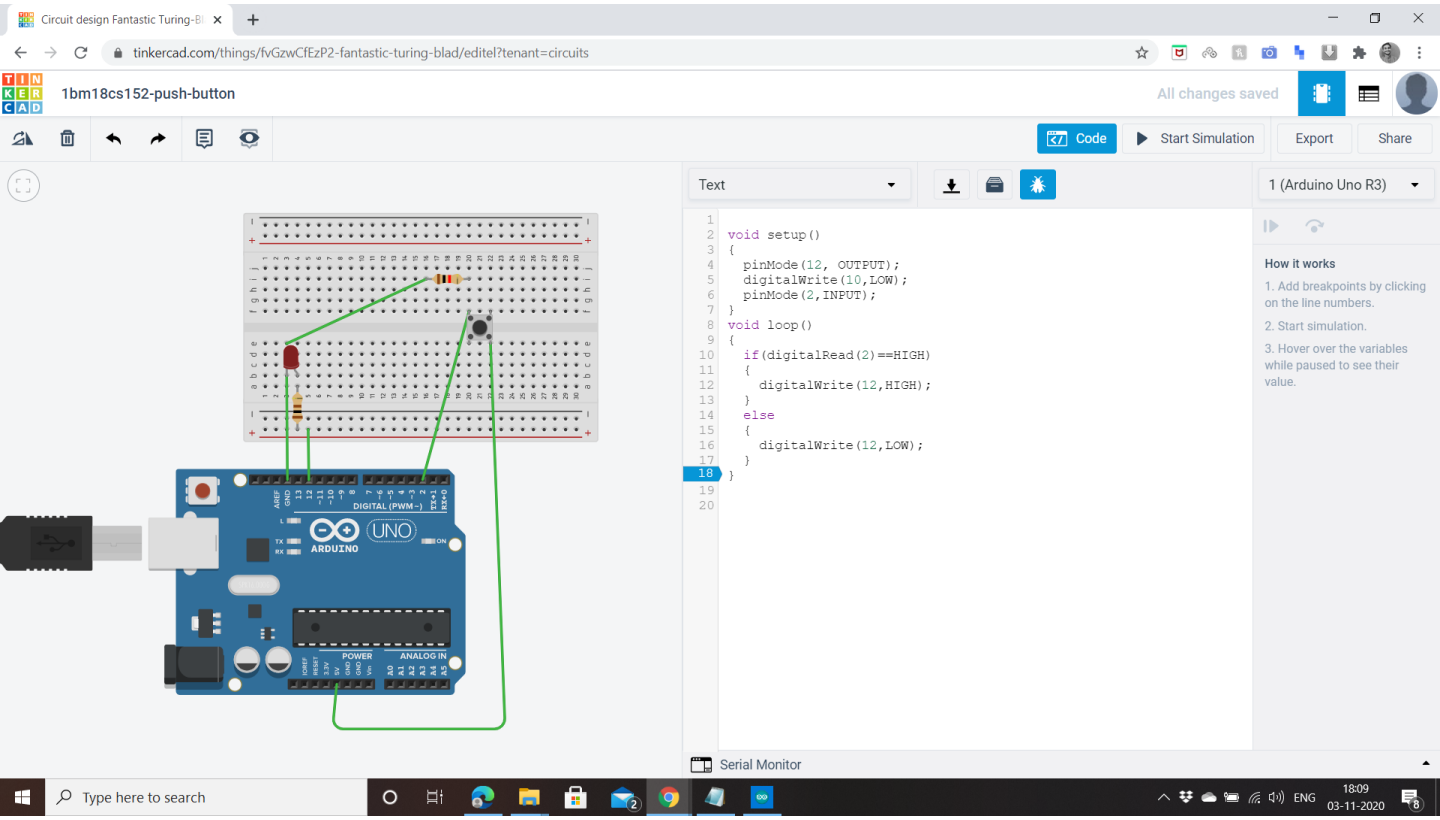
Code

Shivam Vaish
1BM18CS152

```
# define yellow 10
# define green 11
# define red 12

void setup()
{
    pinMode (12, OUTPUT);
    pinMode (11, OUTPUT);
    pinMode (10, OUTPUT);
}

void turnOn (int mypin, int mytime)
{
    digitalWrite (mypin, HIGH);
    delay (mytime);
    digital write (mypin, LOW);
}

Void loop ()
{
    turnon (red, 3000);
    turnon (yellow, 1500);
    turn on (green, 3000);
    turnon (yellow, 1500);
}
```

```
#define yellow 10
#define green 11
#define red 12
void setup()
{
  pinMode(12, OUTPUT);
  pinMode(11,OUTPUT);
  pinMode(10,OUTPUT);
  digitalWrite(12,LOW);
  digitalWrite(11,LOW);
  digitalWrite(10,LOW);
}
void turnon(int mypin,int mytime)
{
  digitalWrite(mypin,HIGH);
  delay(mytime);
  digitalWrite(mypin,LOW);

}
void loop()
{
  turnon(red, 3000);
  turnon(yellow, 1500);

  turnon(green, 3000);
  turnon(yellow, 1500);
}
```

2. Push Button



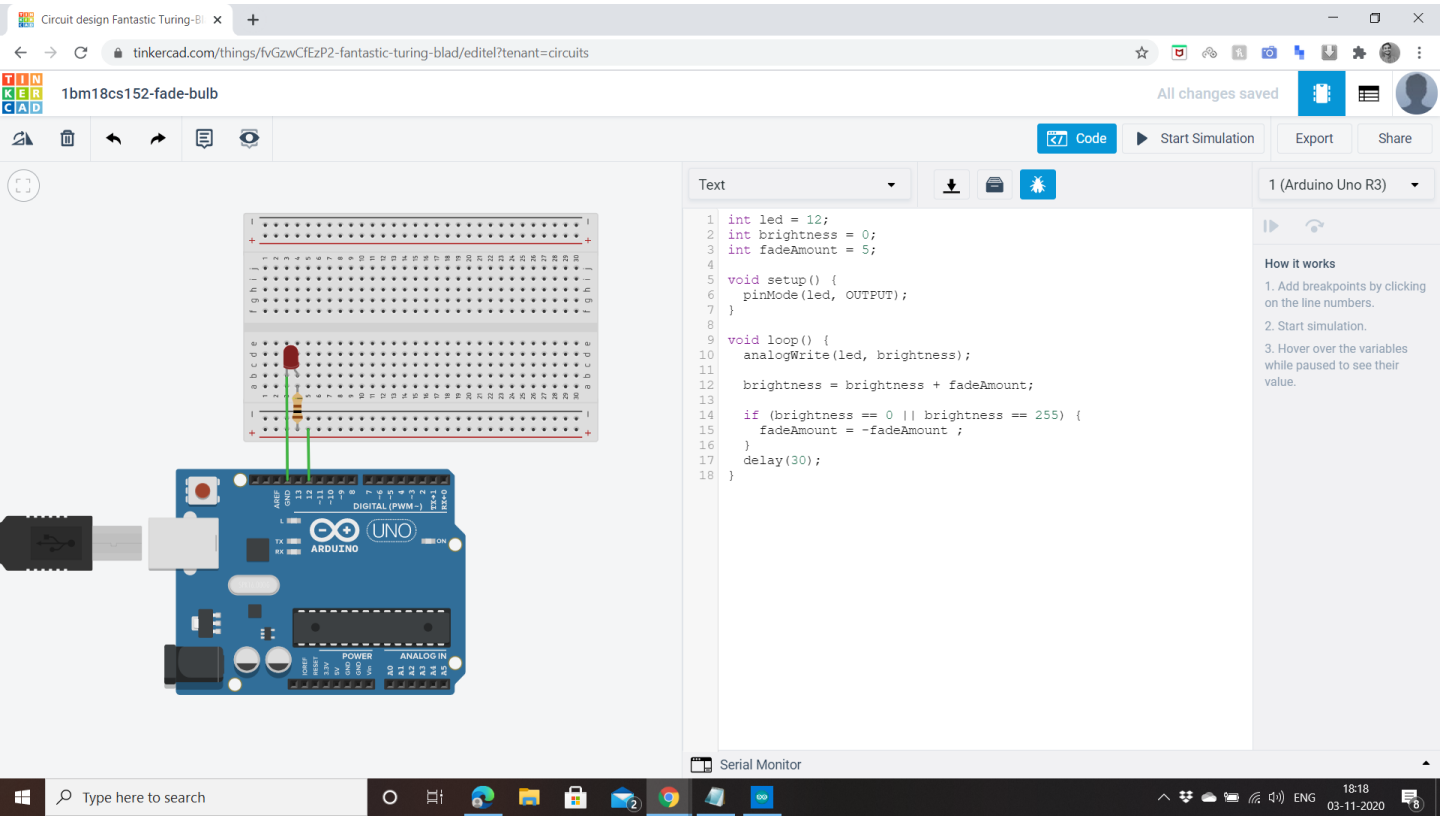
Code

Shivam Vaish
IBM18CS152

```
void Setup()
{
    pinMode(12, OUTPUT);
    digitalWrite(12, LOW);
    pinMode(2, INPUT);
}
void loop()
{
    if (digitalRead(2) == HIGH)
    {   digitalWrite(12, High);
    }
    else
    {   digitalWrite(12, LOW);
    }
}
```

```
void setup()
{
  pinMode(12, OUTPUT);
  digitalWrite(10,LOW);
  pinMode(2,INPUT);
}
void loop()
{
  if(digitalRead(2)==HIGH)
  {
    digitalWrite(12,HIGH);
  }
  else
  {
    digitalWrite(12,LOW);
  }
}
```

3. Fade Bulb


Circuit design Fantastic Turing-Bl
tinkercad.com/things/fvGzwCfEzP2-fantastic-turing-blad/editel?tenant=circuits
1bm18cs152-fade-bulb
All changes saved
Code
Start Simulation
Export
Share
Text
1 (Arduino Uno R3)
int led = 12;
int brightness = 0;
int fadeAmount = 5;
void setup() {
pinMode(led, OUTPUT);
}
void loop() {
analogWrite(led, brightness);
brightness = brightness + fadeAmount;
if (brightness == 0 || brightness == 255) {
fadeAmount = -fadeAmount ;
}
delay(30);
}
How it works
1. Add breakpoints by clicking on the line numbers.
2. Start simulation.
3. Hover over the variables while paused to see their value.
Serial Monitor
Type here to search
ENG
18:18
03-11-2020

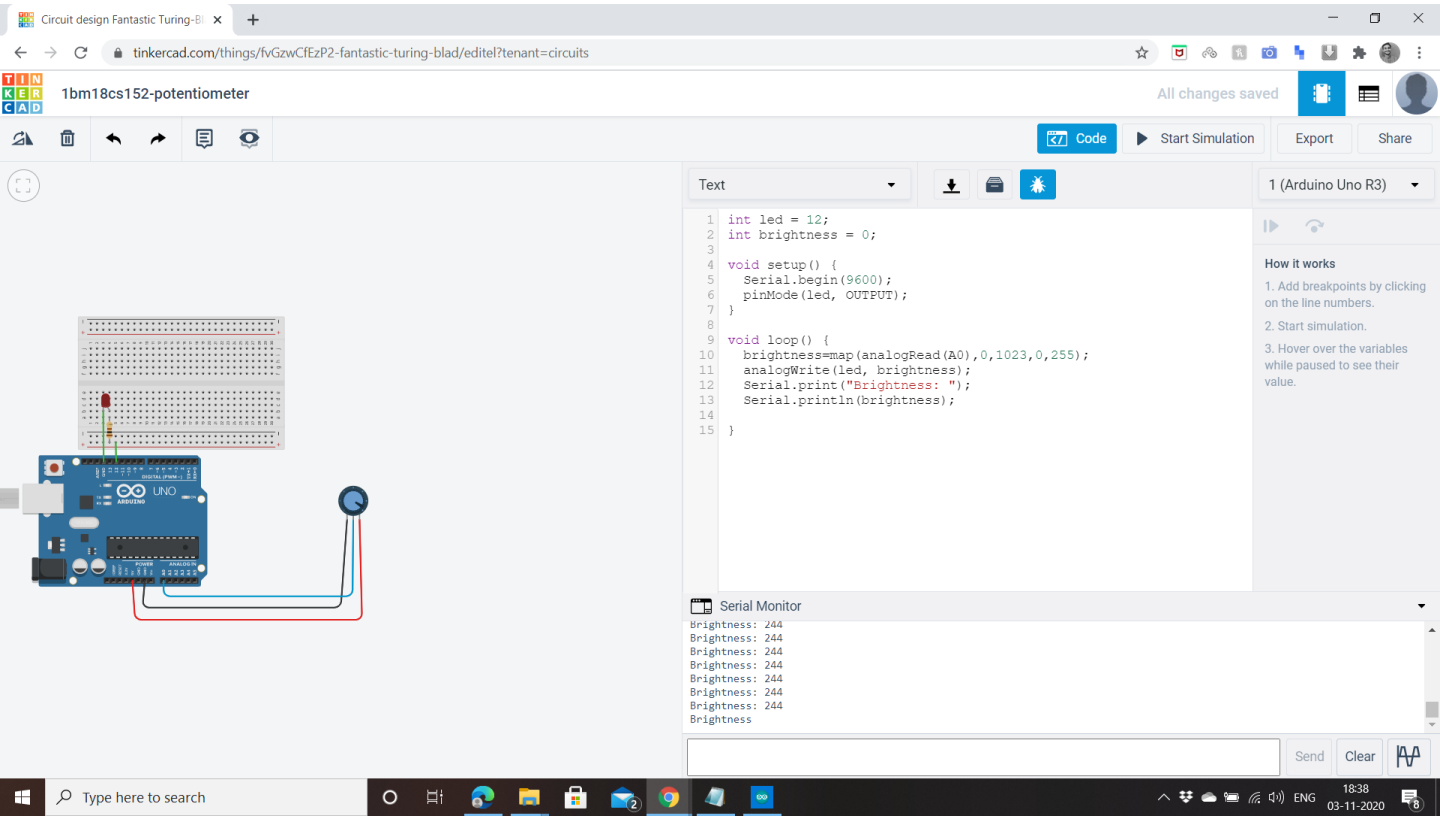
Code

Shivam Vaish
1BM18CS152

```
int led = 12;
int brightness= 0;
INT fade amount = 5;

void setup ()
{
    pinMode (led, Output);
}
Void loop ()
{
    analogWrite (led, brightness);
    brightness = brightness+ fade amount;
    if (brightness == 0 || brightness = 255)
    {
        fade amount = - fadeamount;
    }
     delay (30);
}
```

```
int led = 12;
int brightness = 0;
int fadeAmount = 5;

void setup() {
  pinMode(led, OUTPUT);
}

void loop() {
  analogWrite(led, brightness);

  brightness = brightness +
fadeAmount;

  if (brightness == 0 || brightness
== 255) {
    fadeAmount = -fadeAmount ;
  }
  delay(30);
}
```

4. Potentiometer



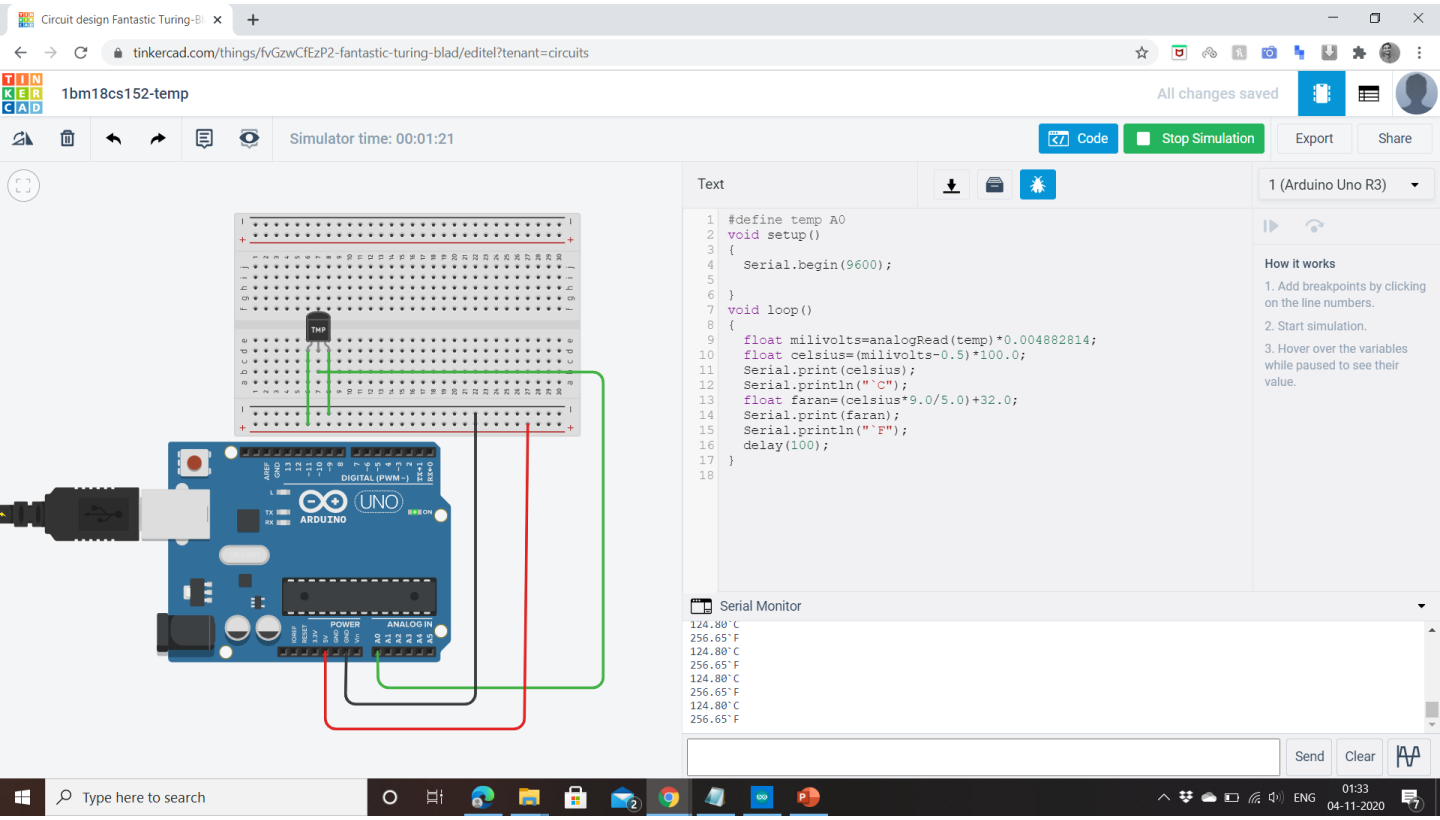
Code

Shivam vaish
1BM18CS152

```
int led = 12
int brightness = 0;
void setup()
{
    Serial.begin(9600);
    pinMode(led, OUTPUT);
}
void loop()
{
    brightness = map(analogRead(A0), 0, 1023, 0, 255);
    analogWrite(led, brightness);
    Serial.print("Brightness: ");
    Serial.println(brightness);
    delay(50);
}
```

```
int led = 12;
int brightness = 0;

void setup() {
  Serial.begin(9600);
  pinMode(led, OUTPUT);
}

void loop() {

brightness=map(analogRead(A0),0
,1023,0,255);
  analogWrite(led, brightness);
  Serial.print("Brightness: ");
  Serial.println(brightness);

}
```

5. Temperature Sensor



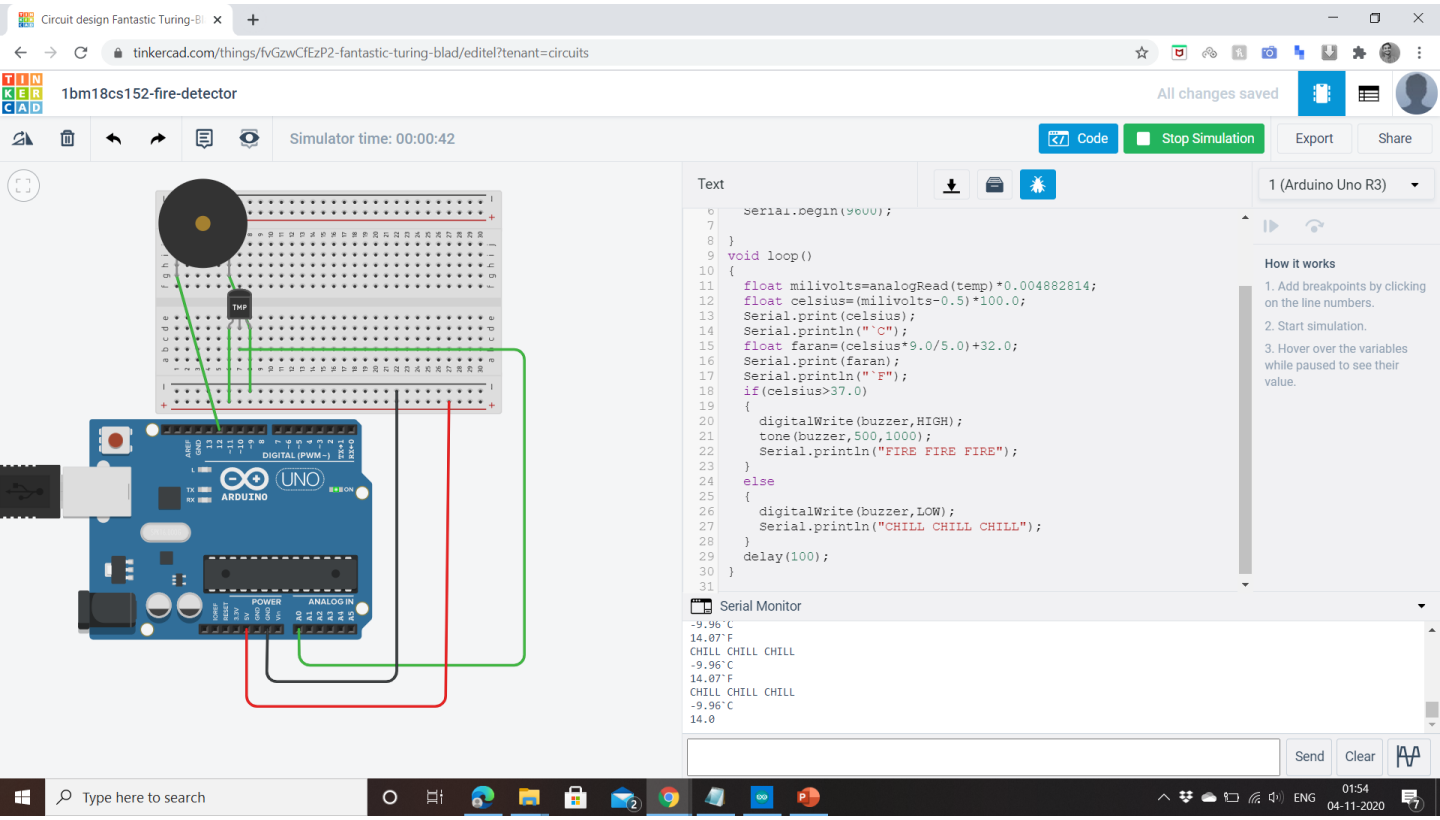
Code

Shivamvaish
1BM18CS152

```
#define temp A0
void setup()
{
    Serial.begin(9600);
}
void loop()
{
    float millivolts = analogRead(temp) * 0.004882814;
    float celsius = (millivolts - 0.5) * 100;
    Serial.print(celsius);
    Serial.println("°C");
    float faran = (celsius * 9.0/5.0) + 32.0;
    Serial.print(faran);
    Serial.println("°F");
    delay(100);
}
```

```
#define temp A0
void setup()
{
  Serial.begin(9600);

}
void loop()
{
  float
milivolts=analogRead(temp)*0.004
882814;
  float celsius=(milivolts-
0.5)*100.0;
  Serial.print(celsius);
  Serial.println("`C");
  float
faran=(celsius*9.0/5.0)+32.0;
  Serial.print(faran);
  Serial.println("`F");
  delay(100);
}
```

6. Fire Detector



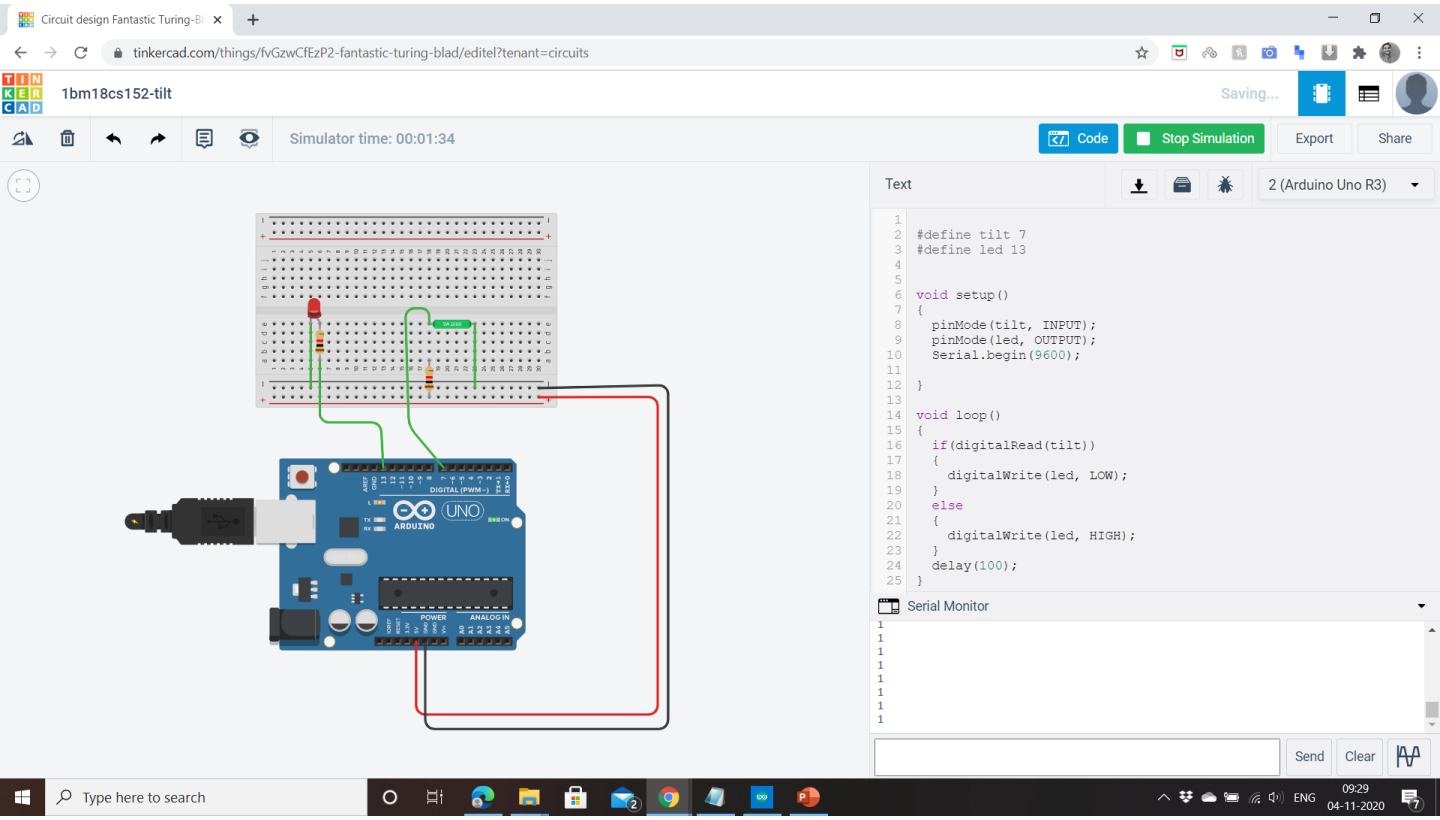
Code

Shivam Vai
1BM18CS

```
# define temp A0
# define buzzer 12
void setup()
{
    pinMode(buzzer, OUTPUT);
    Serial.begin(9600);
}
void loop()
{
    float millivolts = analogRead(temp) * 0.0048828
    float celsius = (millivolts - 0.5) * 100.0;
    Serial.print(celsius);
    Serial.println("°C");
    float faren = (celsius * 9.0/5.0) + 32.0;
    Serial.print(faren);
    Serial.println("°F");
    if (celsius > 37.0)
    {
        digitalWrite(buzzer, HIGH);
        tone(buzzer, 500, 1000);
        Serial.println("Fire Fire Fire");
    }
    else
    {
        digitalWrite(buzzer, LOW);
        Serial.println("Chill");
    }
    delay(100);
}
```

```
#define temp A0
#define buzzer 12
void setup()
{
  pinMode(buzzer, OUTPUT);
  Serial.begin(9600);

}
void loop()
{
  float milivolts=analogRead(temp)*0.004882814;
  float celsius=(milivolts-0.5)*100.0;
  Serial.print(celsius);
  Serial.println("`C");
  float faran=(celsius*9.0/5.0)+32.0;
  Serial.print(faran);
  Serial.println("`F");
  if(celsius>37.0)
  {
    digitalWrite(buzzer,HIGH);
    tone(buzzer,500,1000);
    Serial.println("FIRE FIRE FIRE");
  }
  else
  {
    digitalWrite(buzzer,LOW);
    Serial.println("CHILL CHILL CHILL");
  }
  delay(100);
}
```

7. Tilt Sensor



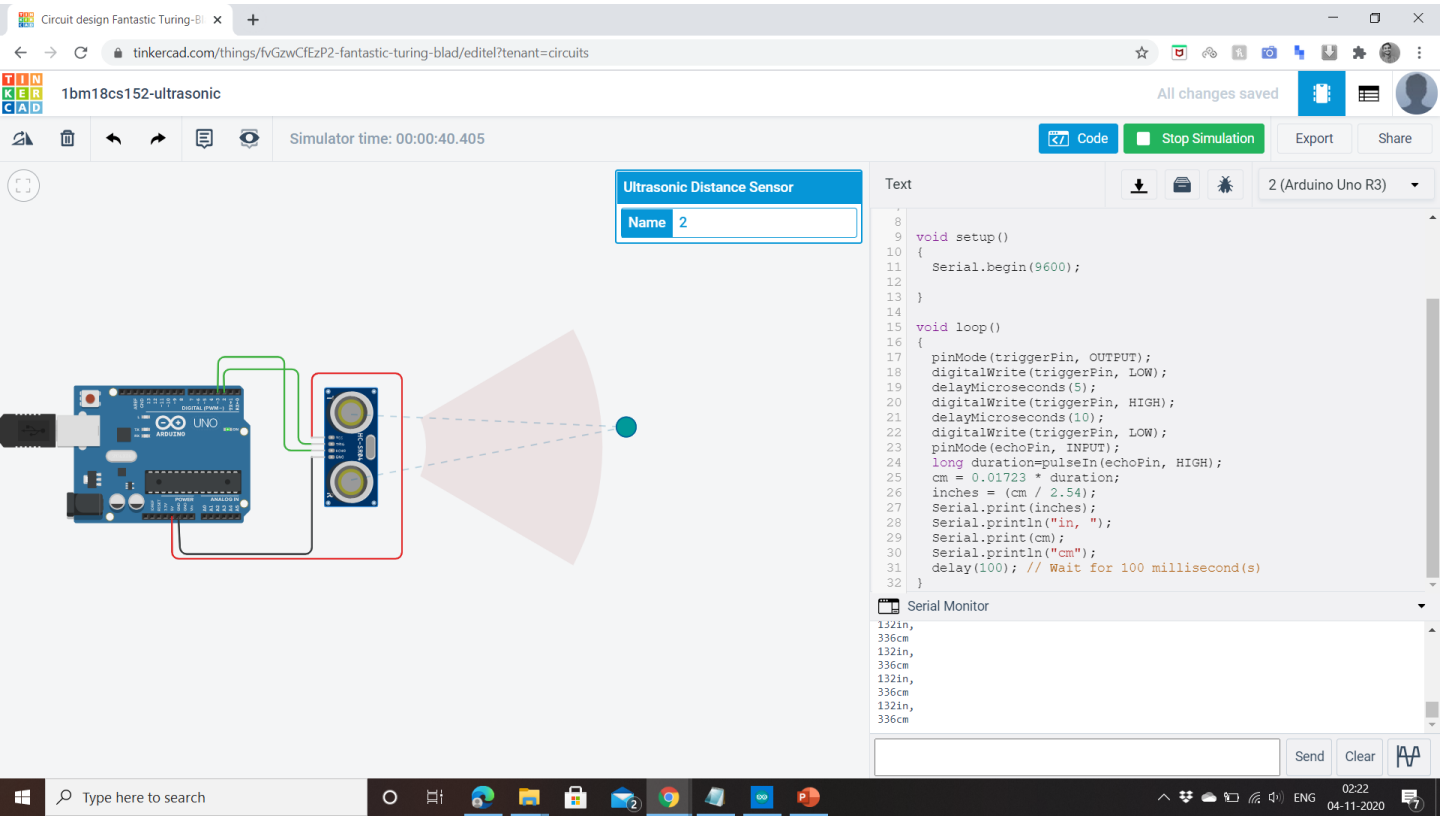
Code

Shriram Vaish
1BM18CS152

```
# define tilt 17
# define led 13
void setup()
{
    pinMode (tilt, INPUT);
    pinMode (led, OUTPUT);
    Serial.begin (9600);
}
void loop ()
{
    if (digitalRead(tilt))
    {
        digitalWrite (led, LOW);
    }
    else
    {
        digitalWrite (led, HIGH);
    }
    delay (100);
}
```

```
#define tilt 7
#define led 13


void setup()
{
  pinMode(tilt, INPUT);
  pinMode(led, OUTPUT);
  Serial.begin(9600);

}

void loop()
{
  if(digitalRead(tilt))
  {
    digitalWrite(led, LOW);
  }
  else
  {
    digitalWrite(led, HIGH);
  }
  delay(100);
}
```

8. Ultrasonic Sensor



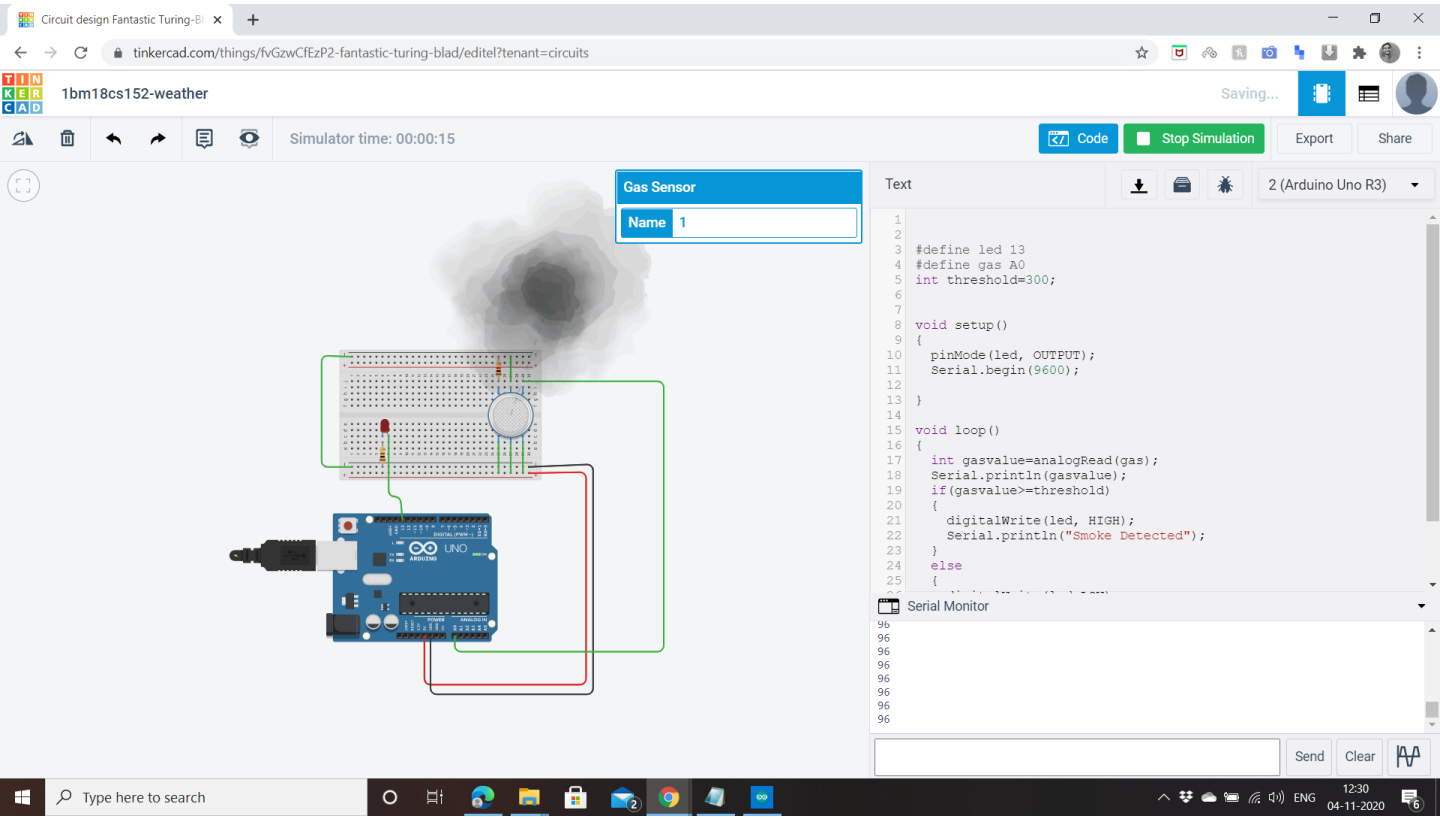
Code

Shivam Yaish
1BM18CS152

```
#define triggerpin 2
# define echopin 3
long inches =0;
long cm = 0;
Void setup ()
{
    Serial.begin (9600);
}
Void loop ()
{
    pinMode (triggerpin, OUTPUT);
    digitalWrite (triggerpin, LOW);
    delayMicroseconds (5);
    digitalWrite (triggerpin, High);
    delayMicroseconds (10);
    digitalWrite (triggerpin, LOW);
    Pinmode (echoPin, INPUT);
    long duration = pulseIn (echopin, HIGH);
    cm = 0.01723 * duration;
    inches = cm/2.54;
    Serial.print (cm);
    Serial.println ("cm");
    Serial.print (inches);
    Serial.println ("inches");
    delay (100);
}
```

```
#define triggerPin 2
#define echoPin 3
long inches = 0;

long cm = 0;


void setup()
{
  Serial.begin(9600);

}

void loop()
{
  pinMode(triggerPin, OUTPUT);
  digitalWrite(triggerPin, LOW);
  delayMicroseconds(5);
  digitalWrite(triggerPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(triggerPin, LOW);
  pinMode(echoPin, INPUT);
  long duration=pulseIn(echoPin, HIGH);
  cm = 0.01723 * duration;
  inches = (cm / 2.54);
  Serial.print(inches);
  Serial.println("in, ");
  Serial.print(cm);
  Serial.println("cm");
  delay(100); // Wait for 100 millisecond(s)
}
```

9. Gas Leakage



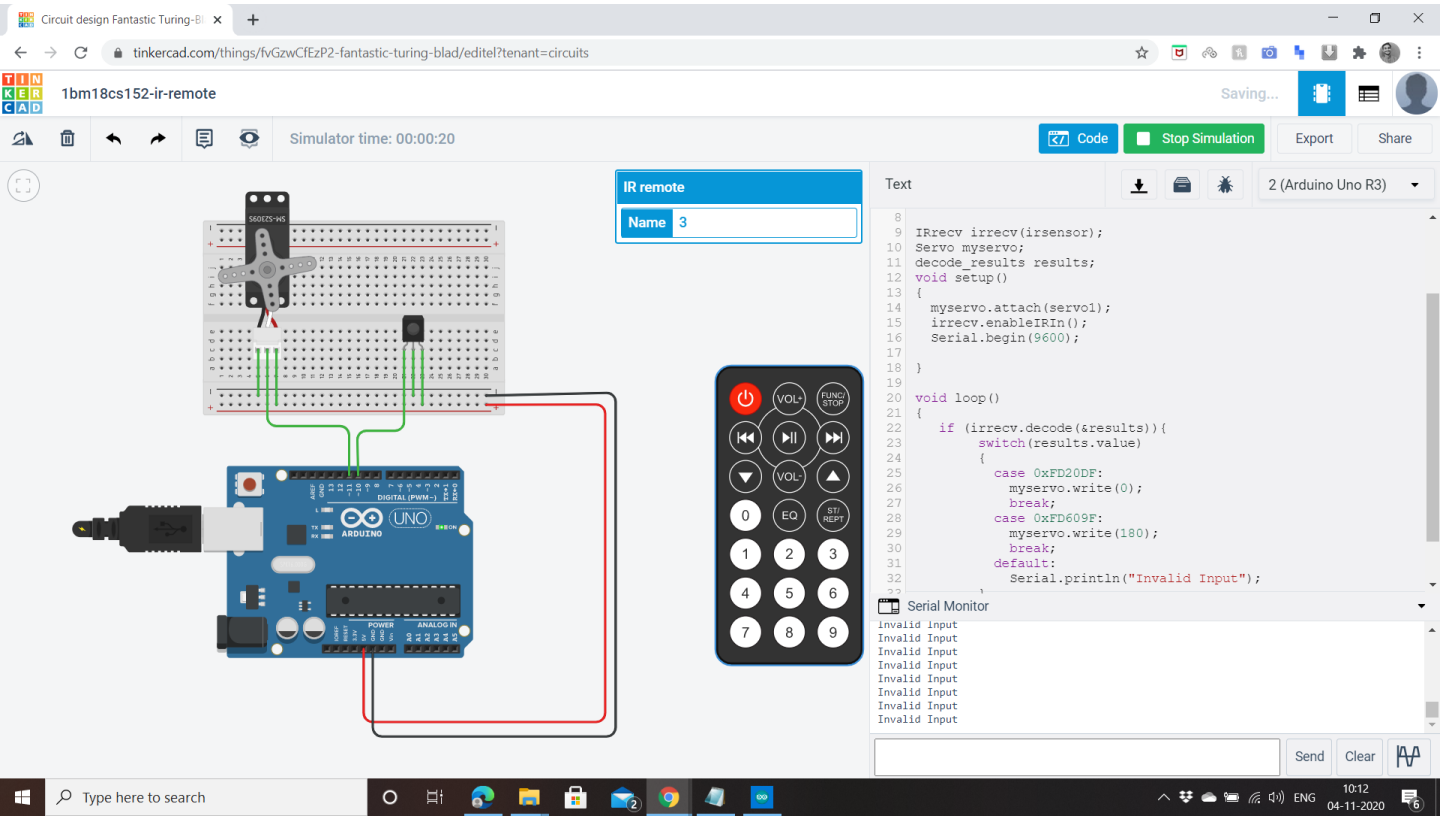
Code

Shivam Vaidya
1BM18CS152

```
#define led 13
#define gas A0
int threshold = 300;
void setup()
{
    pinMode(led, OUTPUT);
    Serial.begin(9600);
}
Void loop()
{
    int gasvalue = analogRead(gas);
    Serial.println(gasvalue);
    if (gasvalue >= threshold)
    {
        digitalWrite(led, HIGH);
        Serial.println("Smoke detected");
    }
    else
    {
        digitalWrite(led, LOW);
    }
    delay(50);
}
```

```
#define led 13
#define gas A0
int threshold=300;


void setup()
{
  pinMode(led, OUTPUT);
  Serial.begin(9600);

}

void loop()
{
  int gasvalue=analogRead(gas);
  Serial.println(gasvalue);
  if(gasvalue>=threshold)
  {
    digitalWrite(led, HIGH);
    Serial.println("Smoke
Detected");
  }
  else
  {
    digitalWrite(led,LOW);
  }
  delay(50);

}
```

10. IR Sensor


Circuit design Fantastic Turing-Bl
tinkercad.com/things/fvGzwCfEzP2-fantastic-turing-blad/editel?tenant=circuits
1bm18cs152-ir-remote
Saving...
Simulator time: 00:00:20
Code
Stop Simulation
Export
Share
IR remote
Name 3
Text
2 (Arduino Uno R3)
IRrecv irrecv(irsensor);
Servo myservo;
decode_results results;
void setup()
{
myservo.attach(servo1);
irrecv.enableIRIn();
Serial.begin(9600);
}
void loop()
{
if (irrecv.decode(&results)){
switch(results.value)
{
case 0xFD20DF:
myservo.write(0);
break;
case 0xFD609F:
myservo.write(180);
break;
default:
Serial.println("Invalid Input");
Serial Monitor
Invalid Input
Send
Clear
Type here to search
ENG
10:12
04-11-2020

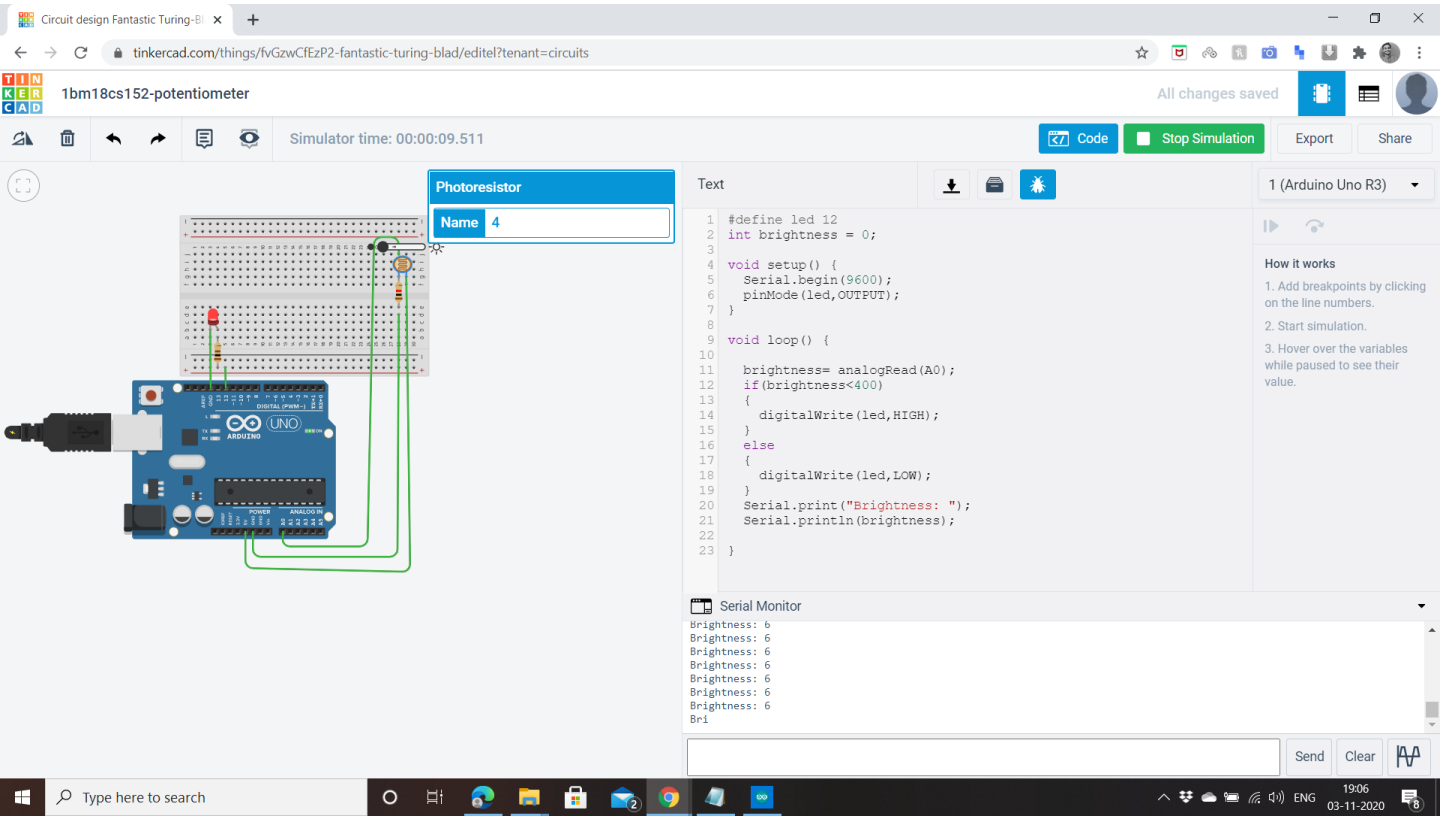
Code

Shivam Vaish
IBM18CS152

```
#include <IRremote.h>
#include <Servo.h>

#define irsensor 10
#define servo1 11

IRrecv irrecv(irsensor);
Servo myservo;
decode_results results;
void setup()
{
    myservo.attach(servo1);
    irrecv.enableIRIn();
    Serial.begin(9600);
}
void loop()
{
    if (irrecv.decode(&results))
    {
        switch(results.value)
        {
            case 0xFD20DF:
                myservo.write(0);
                break;
            case 0xFD609F:
                myservo.write(180);
                break
            default:
                Serial.println("Invalid Input");
        }
        irrecv.resume();
    }
}
```

```
#include <IRremote.h>
#include <Servo.h>



#define irsensor 10
#define servo1 11

IRrecv irrecv(irsensor);
Servo myservo;
decode_results results;
void setup()
{
  myservo.attach(servo1);
  irrecv.enableIRIn();
  Serial.begin(9600);

}

void loop()
{
   if (irrecv.decode(&results)){
        switch(results.value)
        {
          case 0xFD20DF:
                myservo.write(0);
                break;
          case 0xFD609F:
                myservo.write(180);
                break;
          default:
                Serial.println("Invalid Input");
        }
        irrecv.resume();
  }
}
```

11. LDR Sensor



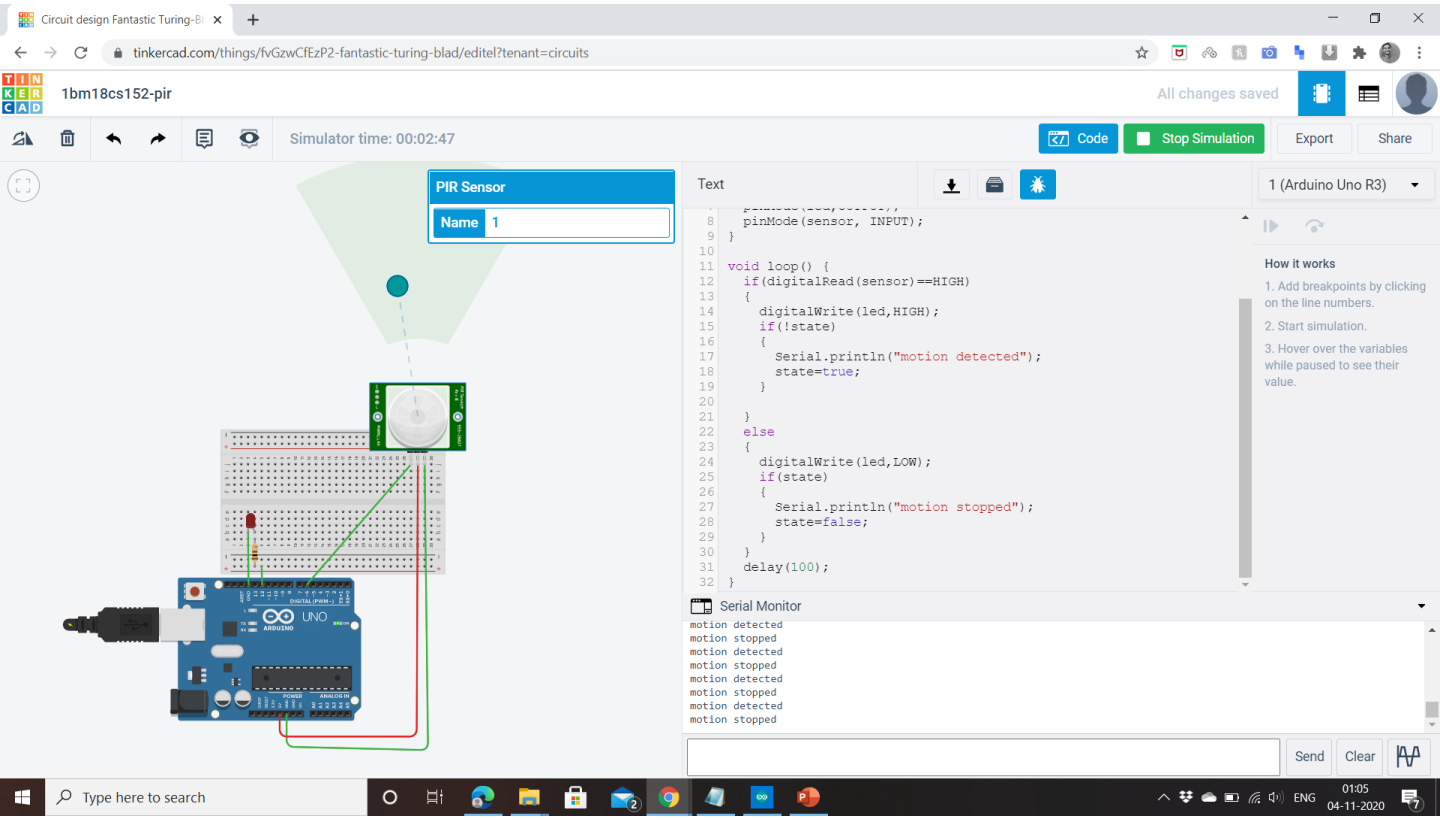
Code

Shivom Vaish
1BM18CS152

```
#define led 12
int brightness = 0;
void setup()
{
    Serial.begin(9600);
    pinMode(led, OUTPUT);
}
void loop()
{
    brightness = analogRead(A0);
    if (brightness <400){
        digitalWrite(led, HIGH);
    }
    else
    {
        digitalWrite(led, LOW);
    }
    Serial.print("Brightness");
    Serial.println(brightness);
}
```

```
#define led 12
int brightness = 0;

void setup() {
  Serial.begin(9600);
  pinMode(led,OUTPUT);
}

void loop() {

  brightness= analogRead(A0);
  if(brightness<400)
  {
    digitalWrite(led,HIGH);
  }
  else
  {
    digitalWrite(led,LOW);
  }
  Serial.print("Brightness: ");
  Serial.println(brightness);

}
```

12. PIR Sensor



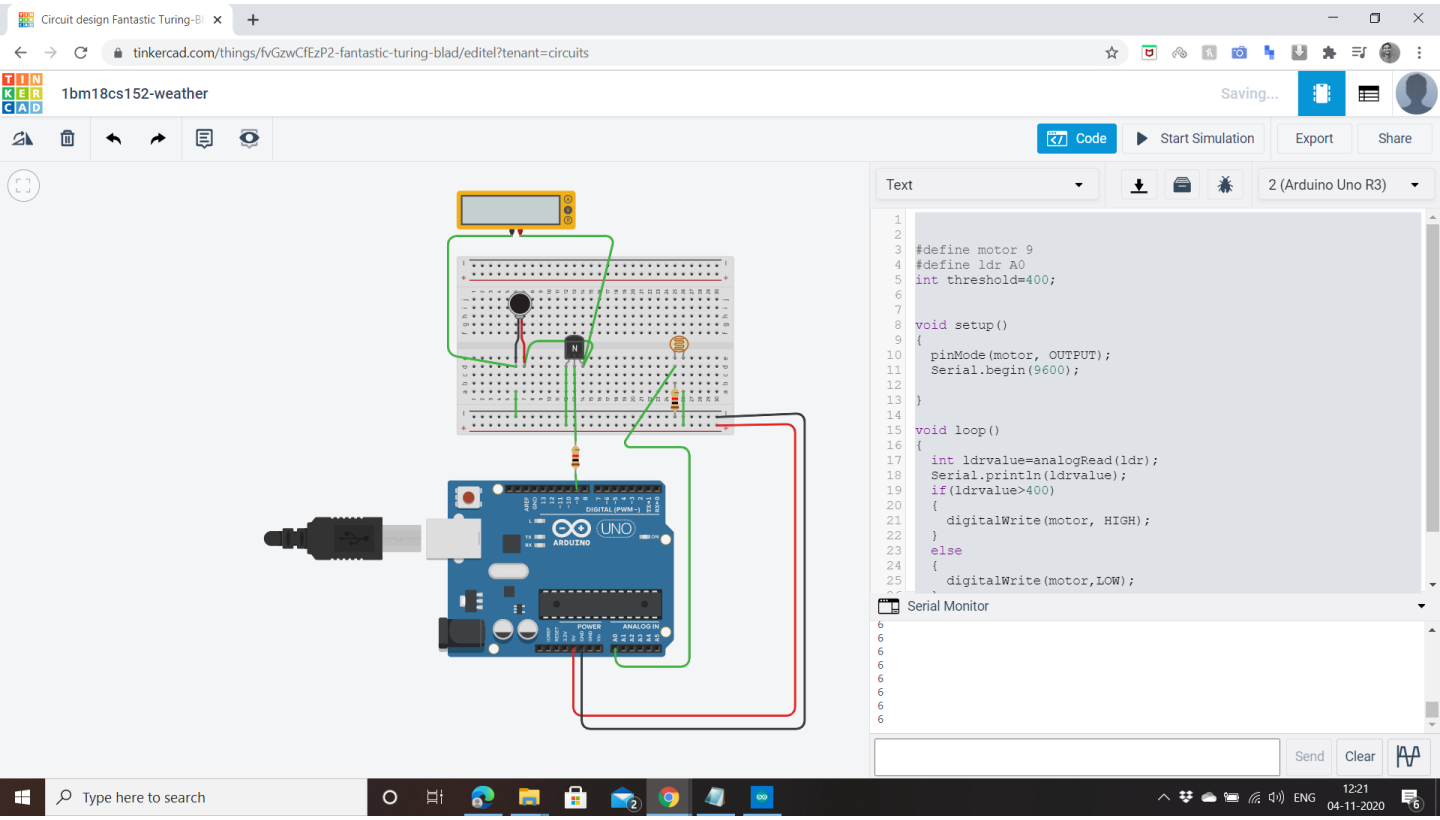
Code

1BM18CS152
Shivam Vaish

```
# define led 12
# define sensor 6
bool state = false;
void setup()
{
    Serial.begin(9600);
    PinMode(led, OUTPUT);
    PinMode(sensor, INPUT);
}
void Loop()
{
    if (digitalRead(sensor) == HIGH)
    {   digitalWrite(led, HIGH);
        if (!State)
        {   Serial.println("motion detected");
            State = true;
        }
    else{
        digitalWrite(led, low);
        if (State){
            Serial.println("motion stopped");
            State = false;
        }
    }delay(100);
}
```

```
#define led 12
#define sensor 6
bool state=false;

void setup() {
  Serial.begin(9600);
  pinMode(led,OUTPUT);
  pinMode(sensor, INPUT);
}

void loop() {
  if(digitalRead(sensor)==HIGH)
  {
    digitalWrite(led,HIGH);
    if(!state)
    {
      Serial.println("motion
detected");
      state=true;
    }

  }
  else
  {
    digitalWrite(led,LOW);
    if(state)
    {
      Serial.println("motion
stopped");
      state=false;
    }
  }
  delay(100);
}
```

13. Weather using Vibrator



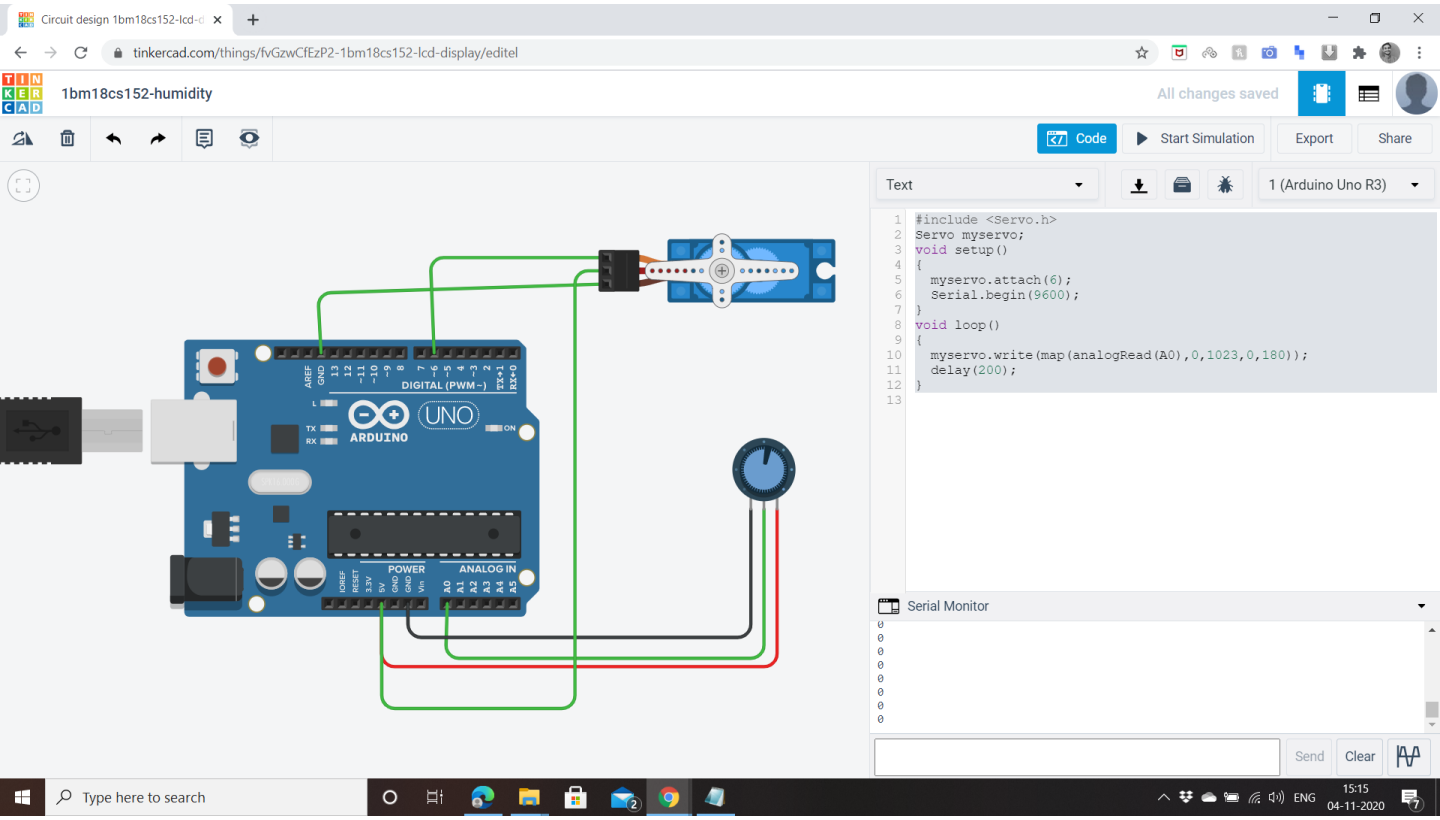
Code

Shivom Vaish
1BM18CS152

```
#define motor 9
#define ldr A0
int threshold = 400;
void setup ()
{
    pinMode( motor, OUTPUT);
    Serial.begin (9600);
}
void loop ()
{
    int ldrvalue = analogRead (ldr);
    Serial.println ( ldrvalue);
    if (ldrvalue >400)
    {   digitalWrite (motor, HIGH);
    }
    else
    {   digitalWrite (motor, LOW);
    }
    delay (100);
}
```

```
#define motor 9
#define ldr A0
int threshold=400;


void setup()
{
  pinMode(motor, OUTPUT);
  Serial.begin(9600);

}

void loop()
{
  int ldrvalue=analogRead(ldr);
  Serial.println(ldrvalue);
  if(ldrvalue>400)
  {
    digitalWrite(motor, HIGH);
  }
  else
  {
    digitalWrite(motor,LOW);
  }
  delay(50);

}
```

14. Humidity Sensor



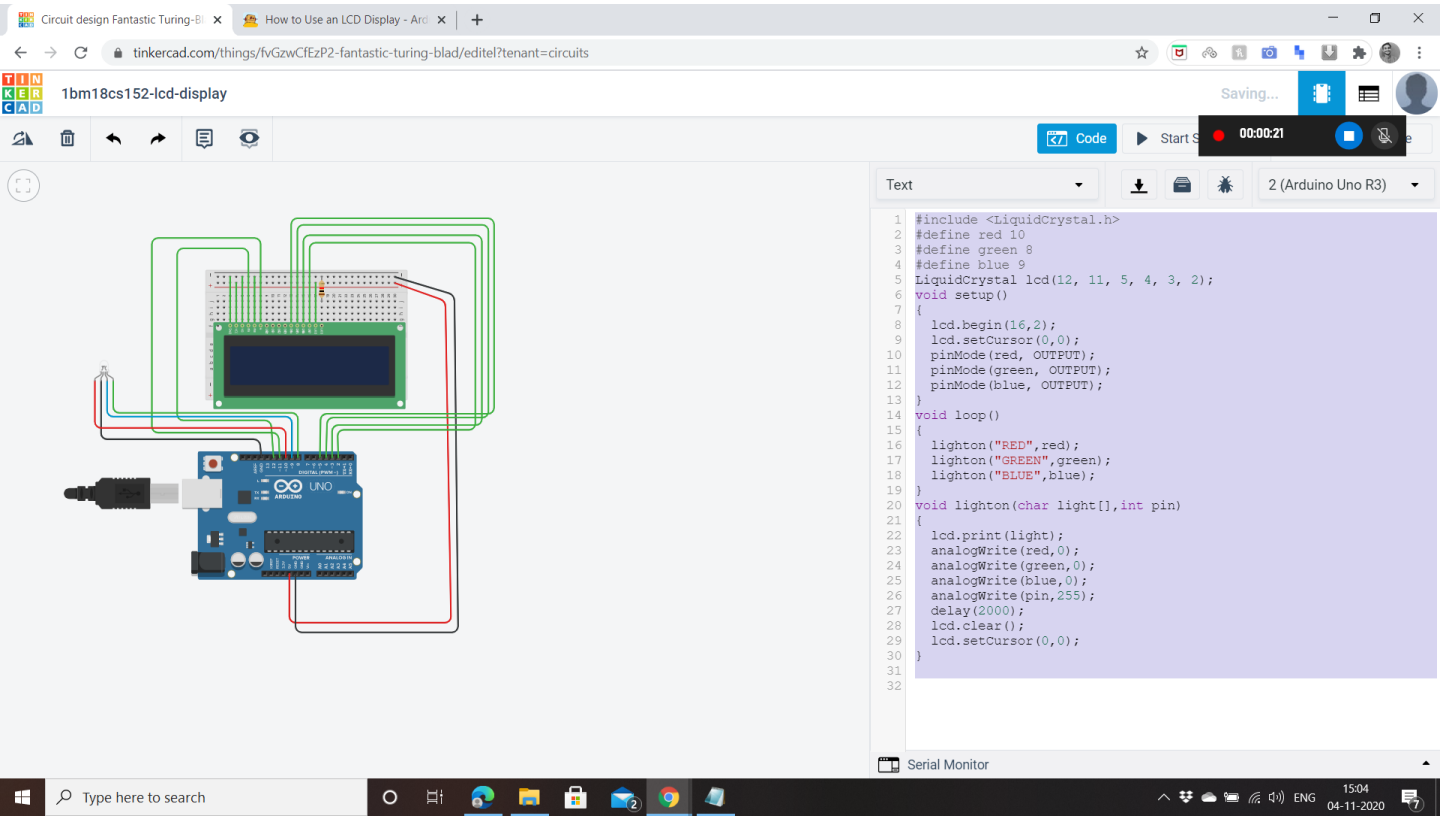
Code

Shivam Vaish
1BM18CS152

```
#include <servo.h>
Servo myservo;
Void setup()
{
    myservo.attach(6);
    Serial.begin(9600);
}
void loop()
{
    myservo.write(map(analogRead(A0),0,1023,0,180));
    delay(200);
}
```

```
#include <Servo.h>
Servo myservo;
void setup()
{
  myservo.attach(6);
  Serial.begin(9600);
}
void loop()
{

myservo.write(map(analogRead(A
0),0,1023,0,180));
  delay(200);
}
```

15. LCD Screen with RGB LEDs



Code

Shivam Vaish
1BM18CS152

```
#include <LiquidCrystal.h>
#define red 10
#define green 8
#define blue 9
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
void setup()
{
    lcd.begin(16,2);
    lcd.setCursor(0,0);
    pinMode(red, OUTPUT);
    pinMode(green, OUTPUT);
    pinMode(Blue, OUTPUT);
}
void loop()
{
    lightOn("RED", red);
    lightOn("GREEN", green);
    lightOn("BLUE", blue);
}
void lightOn(char light[], int pin)
{
    lcd.print(light);
    analogWrite(red,0);
    analogWrite(green,0);
    analogWrite(blue,0);
    analogWrite(pin,255);
    delay(2000);
    lcd.clear();
    lcd.setCursor(0,0);
}
```

```
#include <LiquidCrystal.h>
#define red 10
#define green 8
#define blue 9
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
void setup()
{
  lcd.begin(16,2);
  lcd.setCursor(0,0);
  pinMode(red, OUTPUT);
  pinMode(green, OUTPUT);
  pinMode(blue, OUTPUT);
}
void loop()
{
  lighton("RED",red);
  lighton("GREEN",green);
  lighton("BLUE",blue);
}
void lighton(char light[],int pin)
{
  lcd.print(light);
  analogWrite(red,0);
  analogWrite(green,0);
  analogWrite(blue,0);
  analogWrite(pin,255);
  delay(2000);
  lcd.clear();
  lcd.setCursor(0,0);
}
```