Microprocessor and Computer Architecture Laboratory

UE19CS256

4th Semester, Academic Year 2020-21

Date:25/03/2021

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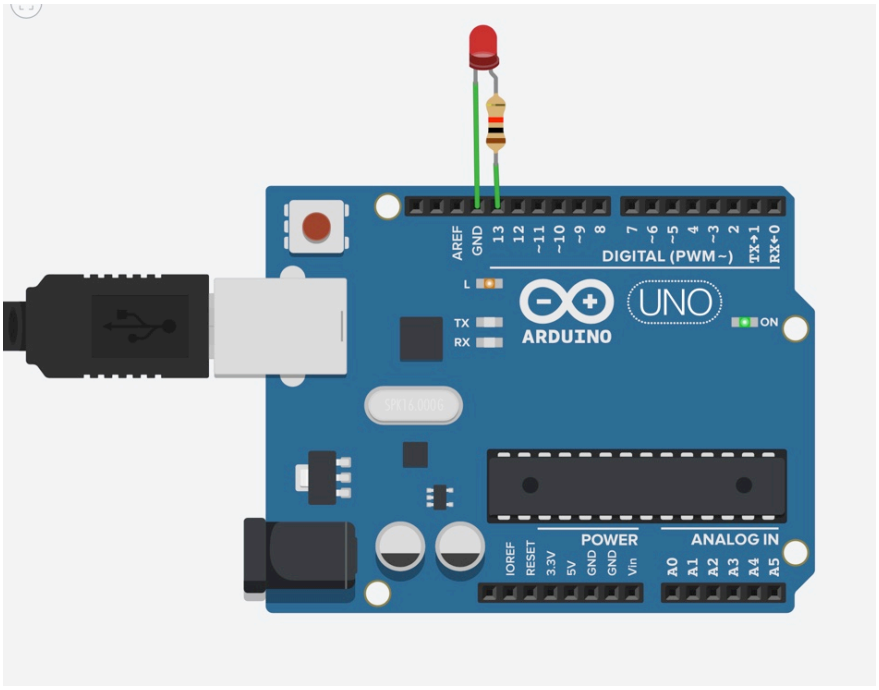
Week#7 Program Number: 1

1. A) Implement a Tinkercad simulation to turn on and off the Arduino's on-board LED.

Arduino Code

```
void setup()
{
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(13, LOW);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

Output Screen Shot

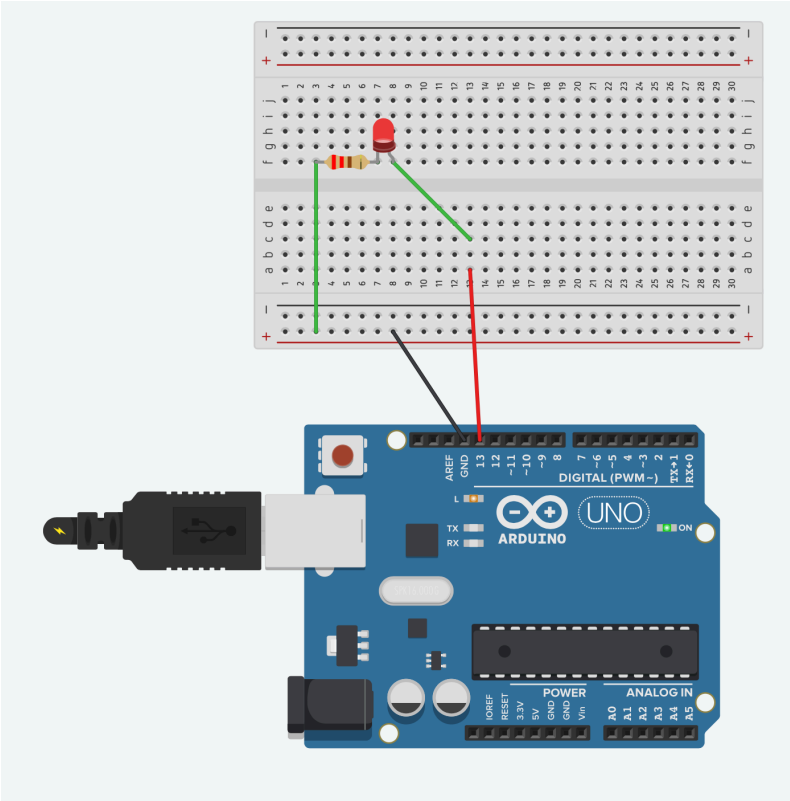


B) Implement a Tinkercad simulation to turn on and off an external LED connected to the Arduino board

Arduino Code

```
void setup()
{
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(13, LOW);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

Output Screen Shot


DIGITAL (PWM~)
UNO
ARDUINO
POWER
ANALOG IN

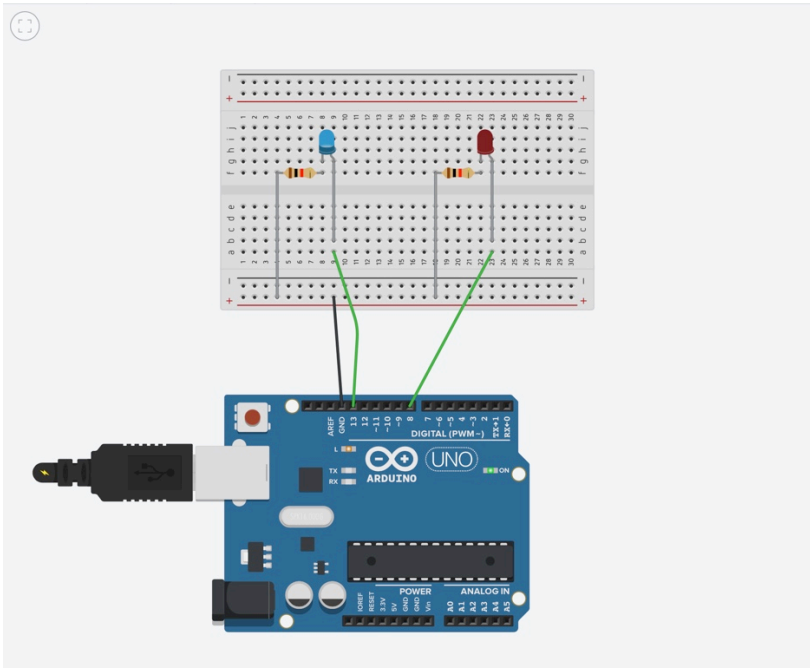
Week#____7_____ Program Number: ____2__

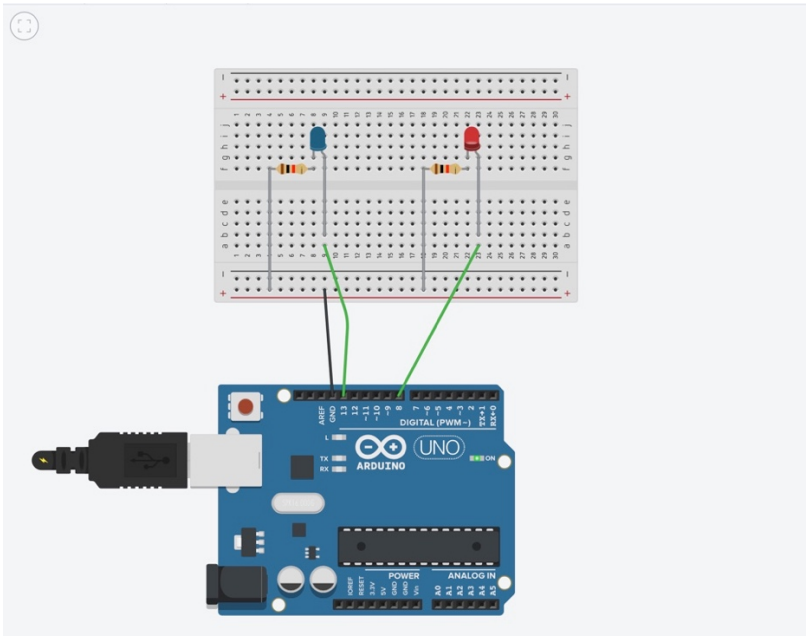
Implement a Tinkercad simulation to alternately turn on and off two external LEDs connected to the Arduino board

Arduino Code

```
int blueled=13; //Declaring the port blue led is connected to
int redled=8; //Declaring the port red led is connected to

int delay_time=1000;  // Setting the delay time
int flag=1; // To alternatively run blue led and red led

void setup()
{
  pinMode(blueled,OUTPUT); // Setting blueled as output
  pinMode(redled,OUTPUT);  // Setting redled as output
}

void loop()
{
  if(flag==1)  // To glow blueled
  {
    digitalWrite(blueled, HIGH);
    digitalWrite(redled, LOW);
    flag=0;
  }
  else // To glow redled
  {
    digitalWrite(redled, HIGH);
    digitalWrite(blueled, LOW);
    flag=1;
  }
  delay(delay_time); //Wait for 1000 ms
}
```

Output Screen Shot


DIGITAL (PWM~)
UNO
ARDUINO
POWER
ANALOG IN


DIGITAL (PWM~)
UNO
ARDUINO
POWER
ANALOG IN

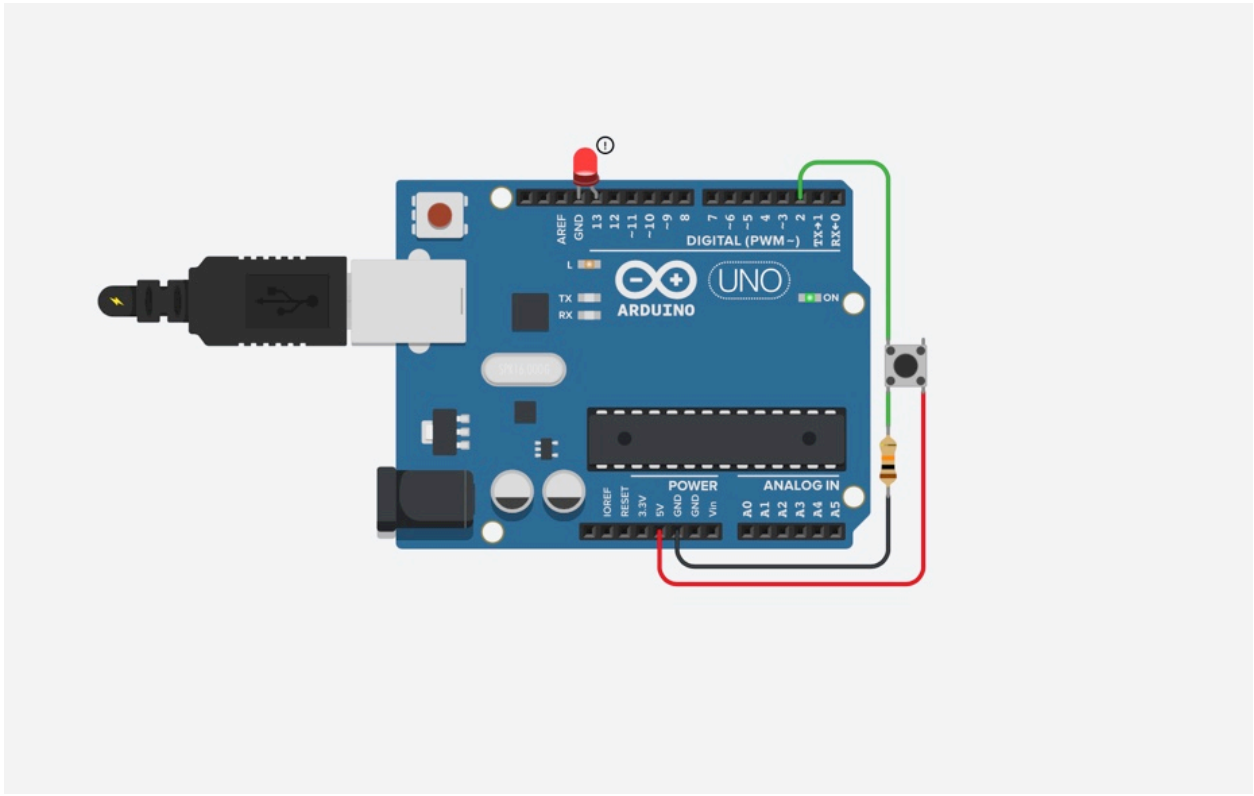
Week#____7_____ Program Number: ____3__

Implement a Tinkercad simulation to use a pushbutton to control an LED.

Arduino Code

```
int buttonState = 0;

void setup()
{
  pinMode(2, INPUT);
  pinMode(13, OUTPUT);
}

void loop()
{
  // read the state of the pushbutton value
  buttonState = digitalRead(2);
  // check if pushbutton is pressed.  if it is, the
  // buttonState is HIGH
  if (buttonState == HIGH) {
    // turn LED on
    digitalWrite(13, HIGH);
  } else {
    // turn LED off
    digitalWrite(13, LOW);
  }
  delay(10); // Delay a little bit to improve simulation performance
}
```

Output Screen Shot


AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
L
TX
RX
ARDUINO
UNO
ON
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5

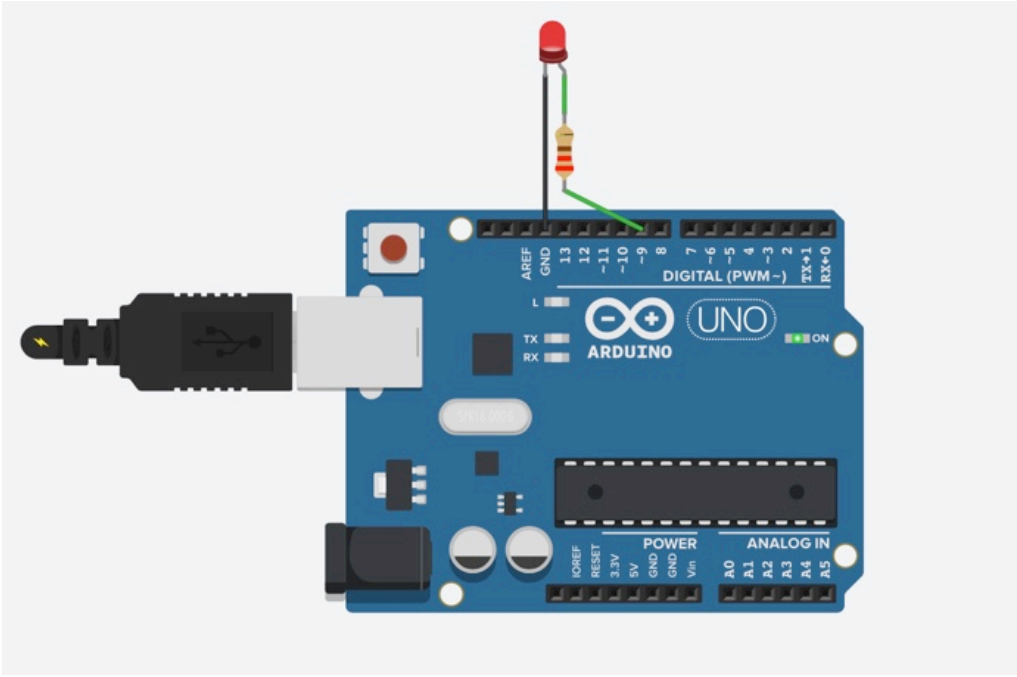
Week#____7_____ Program Number: ___4__

Implement a Tinkercad simulation to demonstrate fading of an LED (zero to maximum brightness slowly)

Arduino Code

```
int brightness = 0;

void setup()
{
  pinMode(9, OUTPUT);
}

void loop()
{
  for (brightness = 0; brightness <= 255; brightness += 5) {
    analogWrite(9, brightness);
    delay(30); // Wait for 30 millisecond(s)
  }
  for (brightness = 255; brightness >= 0; brightness -= 5) {
    analogWrite(9, brightness);
    delay(30); // Wait for 30 millisecond(s)
  }
}
```

Output Screen Shot



Disclaimer:

- The programs and output submitted is duly written, verified and executed by me.
- I have not copied from any of my peers nor from the external resource such as internet.
- If found plagiarized, I will abide with the disciplinary action of the University.

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