

Al-Mustaqbal University
College Of Engineering & Technology
Department of Computer Engineering Techniques
(Stage: 3)

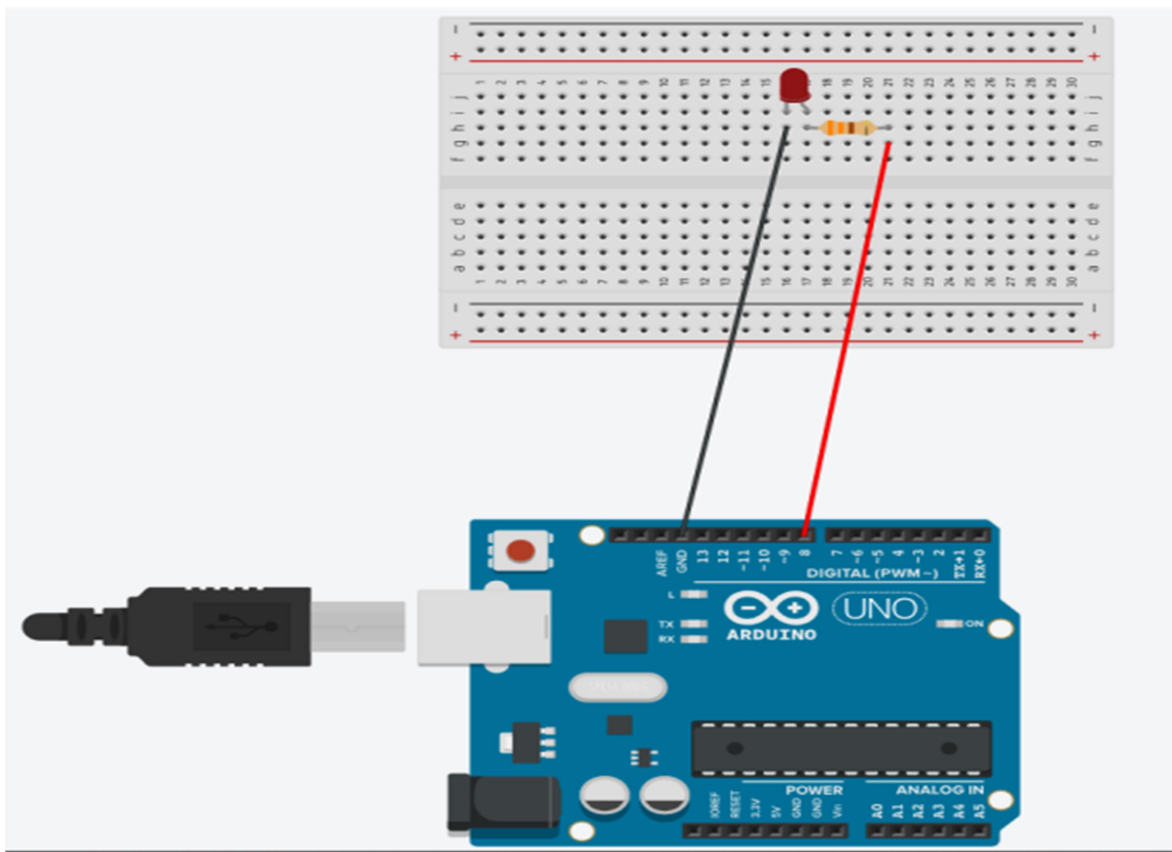
Digital Control

Lecture 4

Arduino programming

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This is the basic ‘hello world’ program used to simply turn something on or off. In this example, an LED is connected to



pin13, and is blinked every second. The resistor may be omitted on this pin since the Arduino has one built in.

```
int ledPin = 13;          // LED on digital pin 13
void setup()             // run once
{
  pinMode(ledPin, OUTPUT); // sets pin 13 as output
}
void loop()              // run over and over again
{
  digitalWrite(ledPin, HIGH); // turns the LED on
  delay(1000);                // pauses for 1 second
  digitalWrite(ledPin, LOW);  // turns the LED off
  delay(1000);                // pauses for 1 second
}
```

Pro. // Write a program to turn the LED on and off five times ?

```
int i;
int red=8;
void setup()
{
```

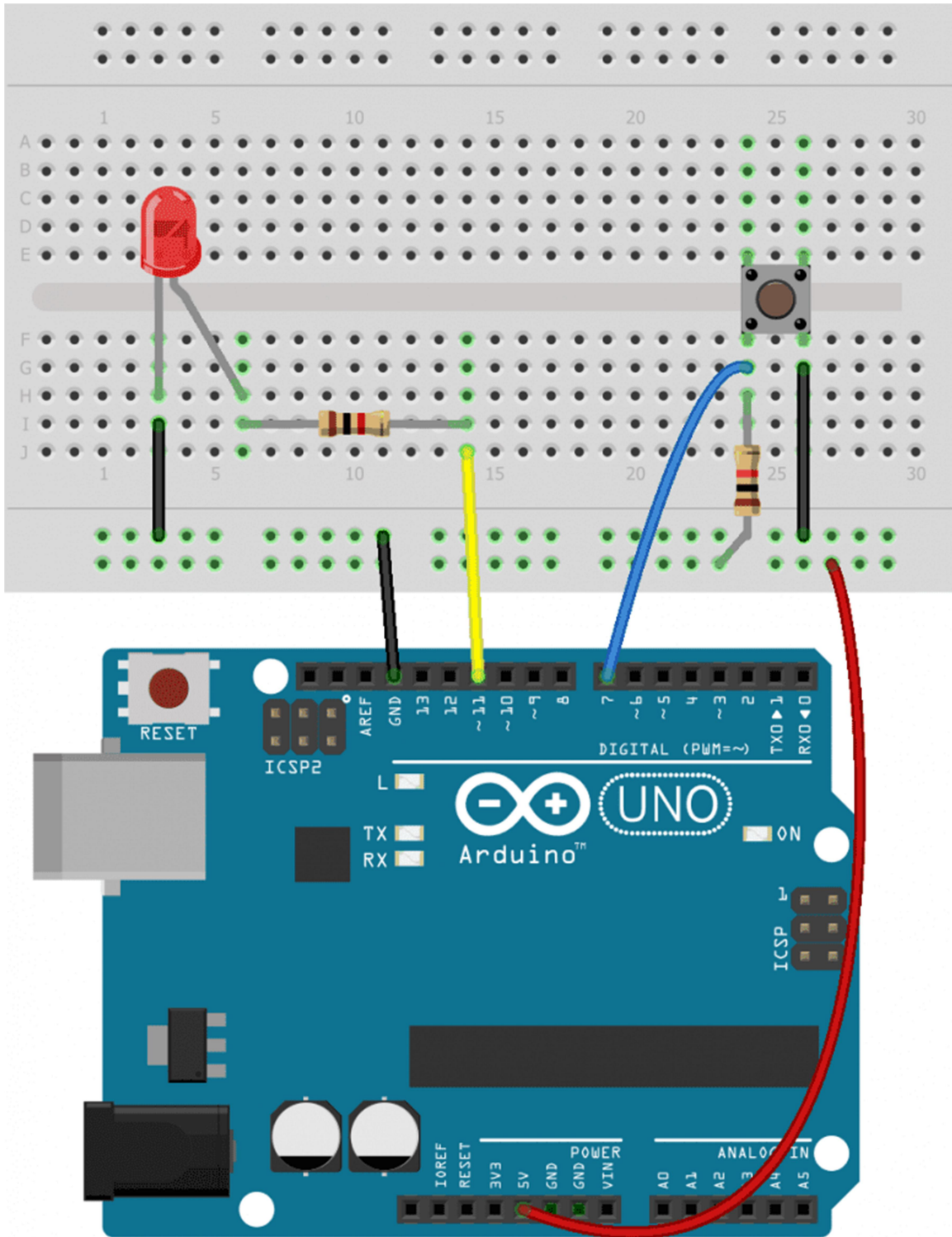
```

    pinMode(red, OUTPUT);
}

void loop()
{
  for (i=0;i<5;i++)
  {
    digitalWrite(red, HIGH);
    delay(1000); // Wait for 1000 millisecond(s)
    digitalWrite(red, LOW);
    delay(1000); // Wait for 1000 millisecond(s)
  }
  digitalWrite(red, LOW);
  while(1){} // to stop program by run infinity loop
}

```

Pro.//This is the simplest form of input with only two possible states: on or off. This example reads a simple switch or pushbutton connected to pin2. When the switch is closed the input pin will read HIGH and turn on an LED.



```
int ledPin = 11;      // output pin for the LED
```

```
int inPin = 7;       // input pin (for a switch)
```

```
void setup()
```

```
{
```

```
  pinMode(ledPin, OUTPUT); // declare LED as output
```

```
  pinMode(inPin, INPUT); // declare switch as input
```

```
}
```

```
void loop()
```

```
{
```

```
  if (digitalRead(inPin) == LOW) // check if input is HIGH
```

```
  {
```

```
    digitalWrite(ledPin, HIGH); // turns the LED on
```

```
  }
```

```
  else
```

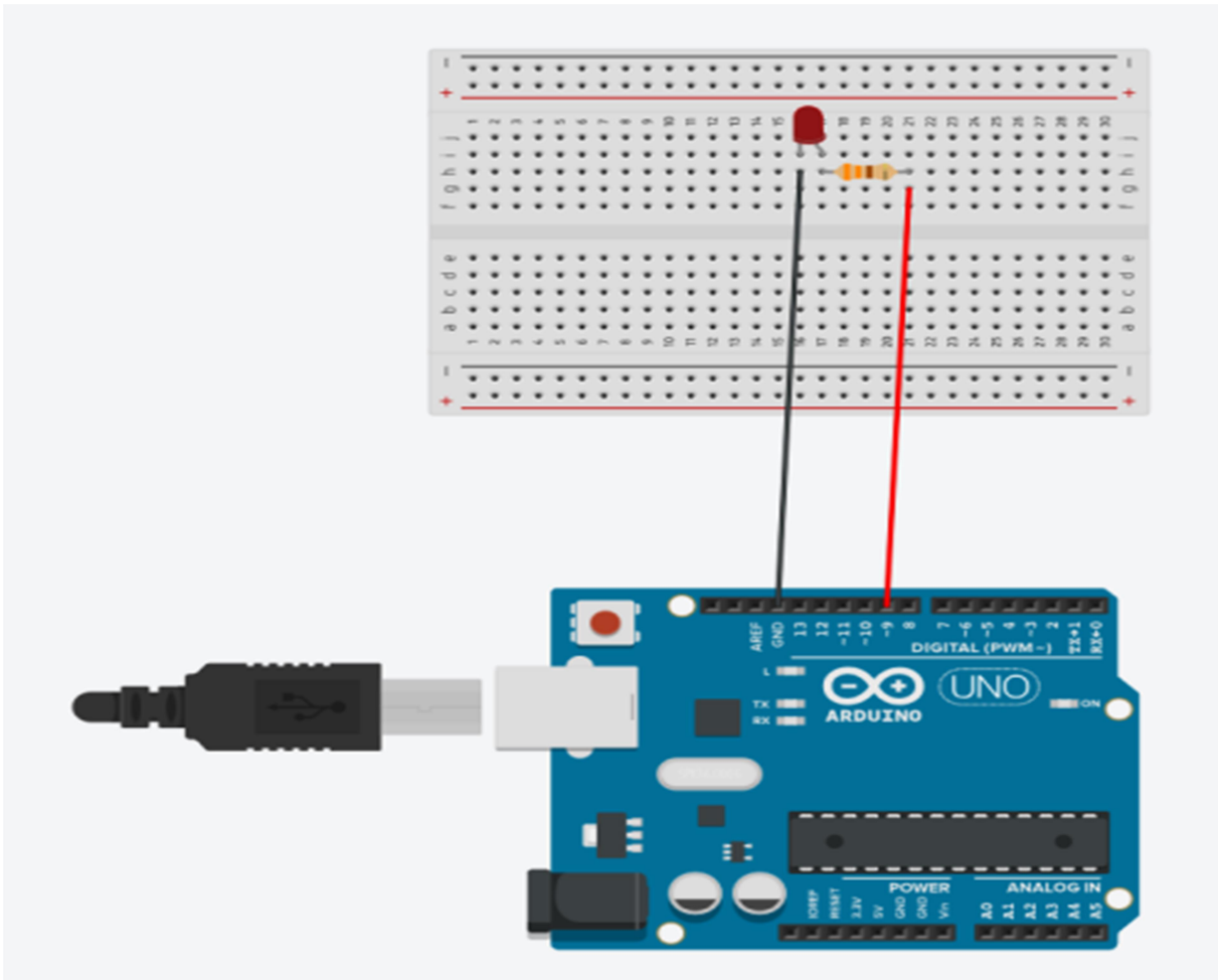
```
  {
```

```
    digitalWrite(ledPin, LOW); // turns the LED on
```

```
  }
```

```
}
```

Q // Pulse width Modulation (PWM) is a way to fake an analog output by pulsing the output. This could be used to dim and brighten an LED or later to control a servo motor. The following example slowly brightens and dims an LED using for loops.



```
int ledPin = 9; // PWM pin for the LED  
void setup()  
{
```

```
}    // no setup needed  
void loop()  
{  
    for (int i=0; i<=255; i++) // ascending value for i  
    {  
        analogWrite(ledPin, i); // sets brightness level to i  
        delay(100);           // pauses for 100ms  
    }  
    for (int i=255; i>=0; i--) // descending value for i  
    {  
        analogWrite(ledPin, i); // sets brightness level to i  
        delay(100);           // pauses for 100ms  
    }  
}
```