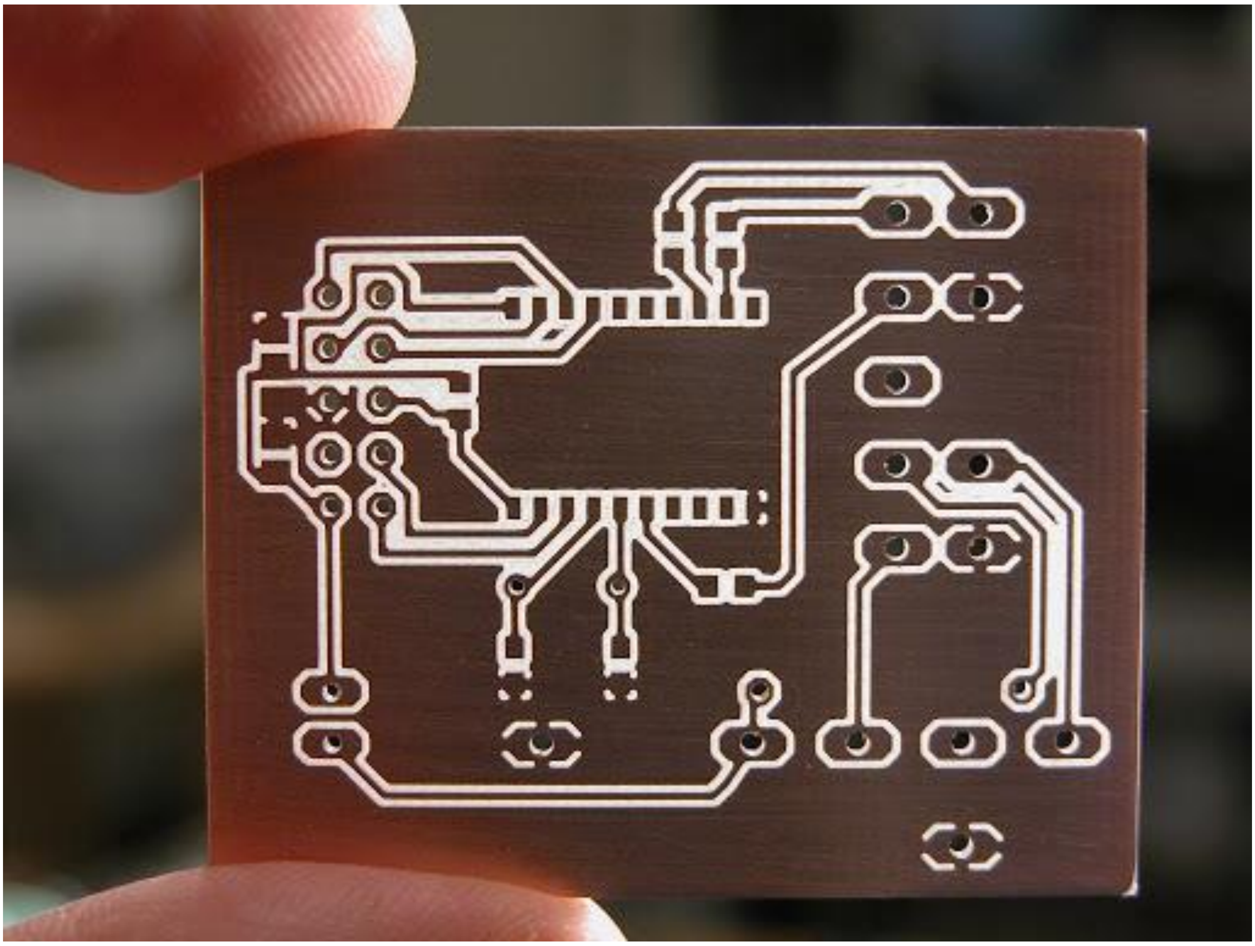
PCB manufacturing

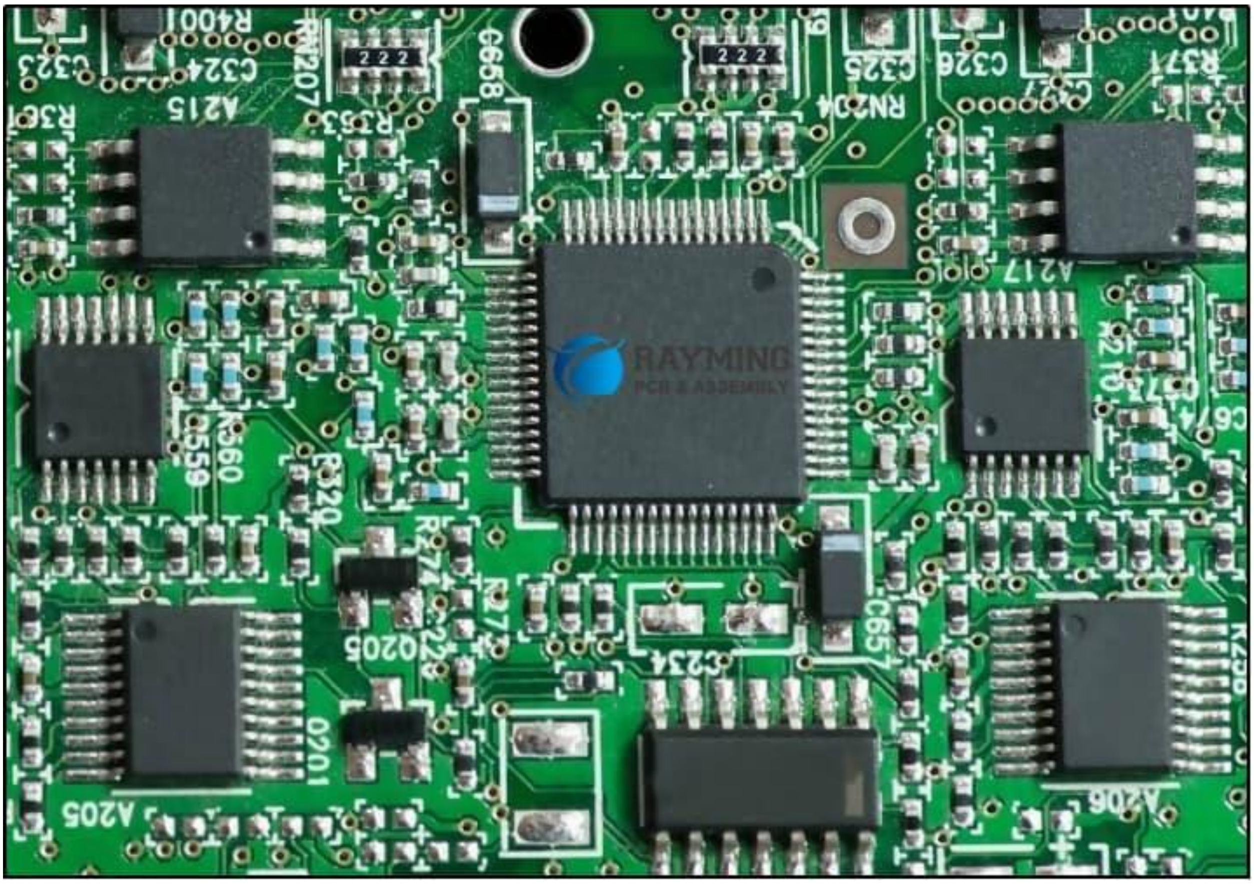
(Printed circuit boards)



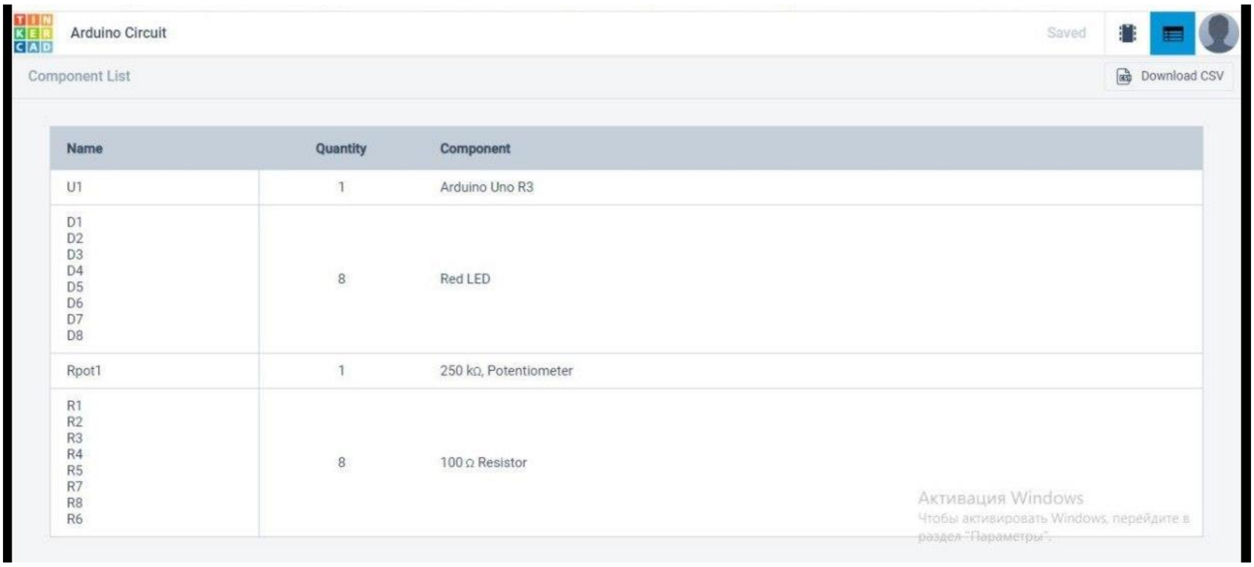
What is PCB?

A **printed circuit board (PCB**) mechanically supports and electrically connects electrical or electronic components using conductive tracks, pads and other features etched from one or more sheet layers of copper laminated onto and/or between sheet layers of a non-conductive substrate. Components are generally soldered onto the PCB to both electrically connect and mechanically fasten them to it.

Printed circuit boards are used in all but the simplest electronic products. They are also used in some electrical products, such as passive switch boxes.



1. Materials



Arduino Circuit

Saved

Component List

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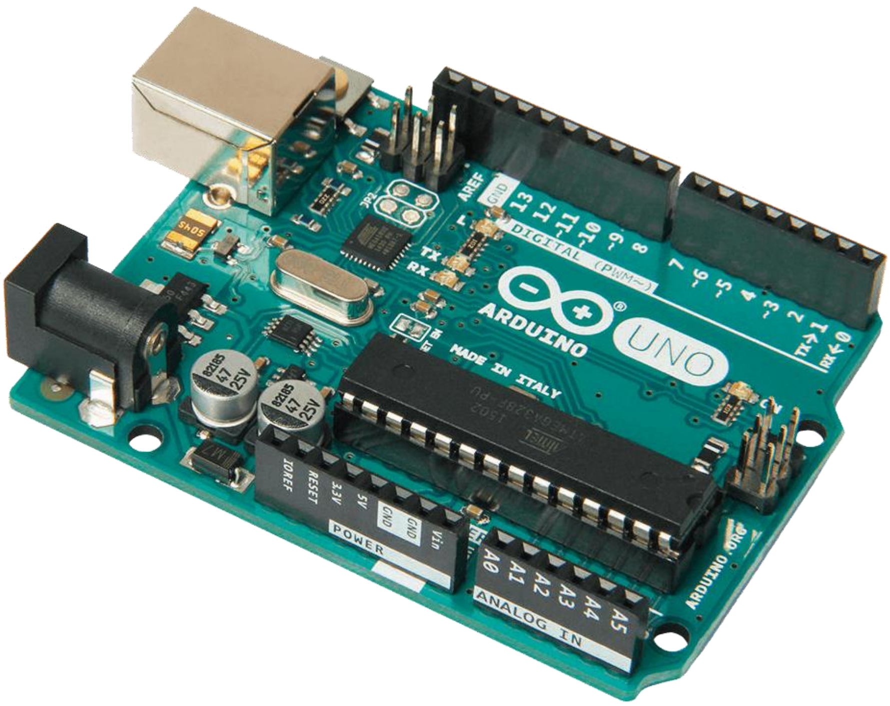
Name	Quantity	Component
U1	1	Arduino Uno R3
D1 D2 D3 D4 D5 D6 D7 D8	8	Red LED
Rpot1	1	250 kΩ, Potentiometer
R1 R2 R3 R4 R5 R7 R8 R6	8	100 Ω Resistor

Arduino Uno R3



The Arduino Uno R3 is a microcontroller board based on a removable, dual-inline-package (DIP) ATmega328 AVR microcontroller. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs). Programs can be loaded on to it from the easy-to-use Arduino computer program. The Arduino has an extensive support community, which makes it a very easy way to get started working with embedded electronics. The R3 is the third, and latest, revision of the Arduino Uno.

Red LED

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons.

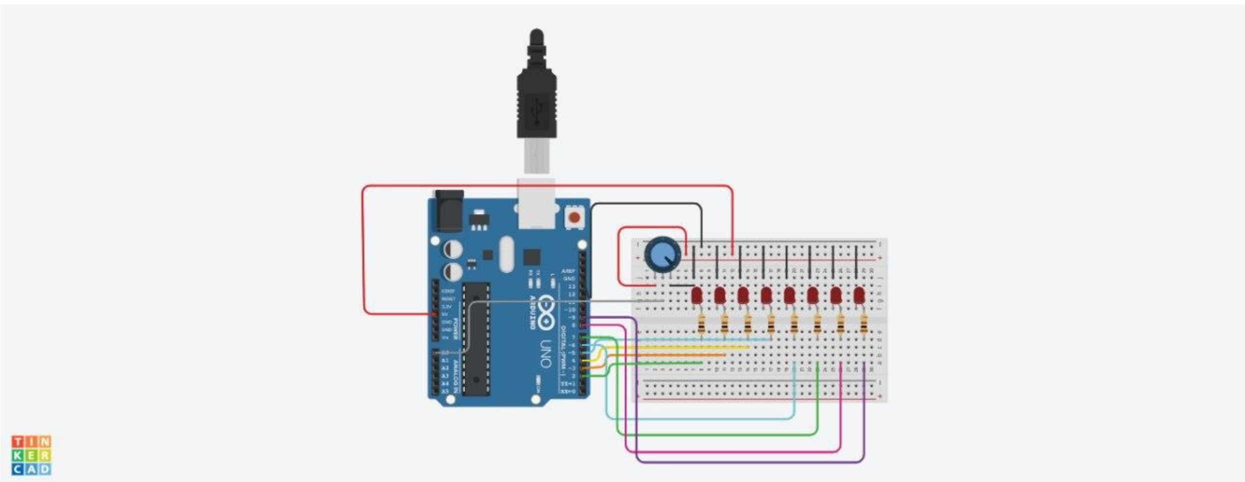
250 kΩ, Potentiometer

The measuring instrument called a potentiometer is essentially a voltage divider used for measuring electric potential (voltage); the component is an implementation of the same principle, hence its name. Potentiometers are commonly used to control electrical devices such as volume controls on audio equipment.

100 Ω Resistor

The main function of resistors in a circuit is to control the flow of current to other components. Take an LED (light) for example. If too much current flows through an LED it is destroyed. So a resistor is used to limit the current.

2. Connections



3. Code

```
int led1 = 2;
int led2 = 3;
int led3 = 4;
int led4 = 5;
int led5 = 6;
int led6 = 7;
int led7 = 8;
int led8 = 9;

int poten = A0;
int delayperiod = 0;
int invalue;

void setup()
{
  pinMode(led1, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  pinMode(led4, OUTPUT);
  pinMode(led5, OUTPUT);
  pinMode(led6, OUTPUT);
  pinMode(led7, OUTPUT);
  pinMode(led8, OUTPUT);

  pinMode(poten, INPUT);
}

```


```

void setup()
{
  pinMode(led1, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  pinMode(led4, OUTPUT);
  pinMode(led5, OUTPUT);
  pinMode(led6, OUTPUT);
  pinMode(led7, OUTPUT);
  pinMode(led8, OUTPUT);

  pinMode(poten, INPUT);
}

```


```
void loop()
{
  invalue = analogRead(poten);
  delayperiod = map(invalue,0,1023,0,1000);

  digitalWrite(led1, HIGH);
  delay(delayperiod);
  digitalWrite(led2, HIGH);
  delay(delayperiod);
  digitalWrite(led3, HIGH);
  delay(delayperiod);
  digitalWrite(led4, HIGH);
  delay(delayperiod);
  digitalWrite(led5, HIGH);
  delay(delayperiod);
  digitalWrite(led6, HIGH);
  delay(delayperiod);
  digitalWrite(led7, HIGH);
  delay(delayperiod);
  digitalWrite(led8, HIGH);
  delay(delayperiod);

  digitalWrite(led1, LOW);
  delay(delayperiod);

  digitalWrite(led2, LOW);
  delay(delayperiod);

```

```

  digitalWrite(led3, LOW);
  delay(delayperiod);

  digitalWrite(led4, LOW);
  delay(delayperiod);

  digitalWrite(led5, LOW);
  delay(delayperiod);

  digitalWrite(led6, LOW);
  delay(delayperiod);

  digitalWrite(led7, LOW);
  delay(delayperiod);

  digitalWrite(led8, LOW);
  delay(delayperiod);
}
```

References:

1. Wikipedia contributors. (2020, May 12). Printed circuit board. In *Wikipedia, The Free Encyclopedia*. Retrieved 16:35, May 15, 2020, from https://en.wikipedia.org/w/index.php?title=Printed_circuit_board&oldid=956292780