

Activity 4 : Having Fun with Arduino

Group No : 03

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Part 2 : Serial and PWM

What is the meaning of "Baud Rate"? What is the unit of the "Baud Rate"?

Baud Rate is the data bit transfer rate of serial communication. Represented in bits per second.

Try to control the LED from serial input. '1' to turn on the LED, '0' to turn off the LED. (Change circuit without Button switch).

```
const int LED_PIN = 2;
const int BUTTON_PIN = 3;

int ledState = LOW;

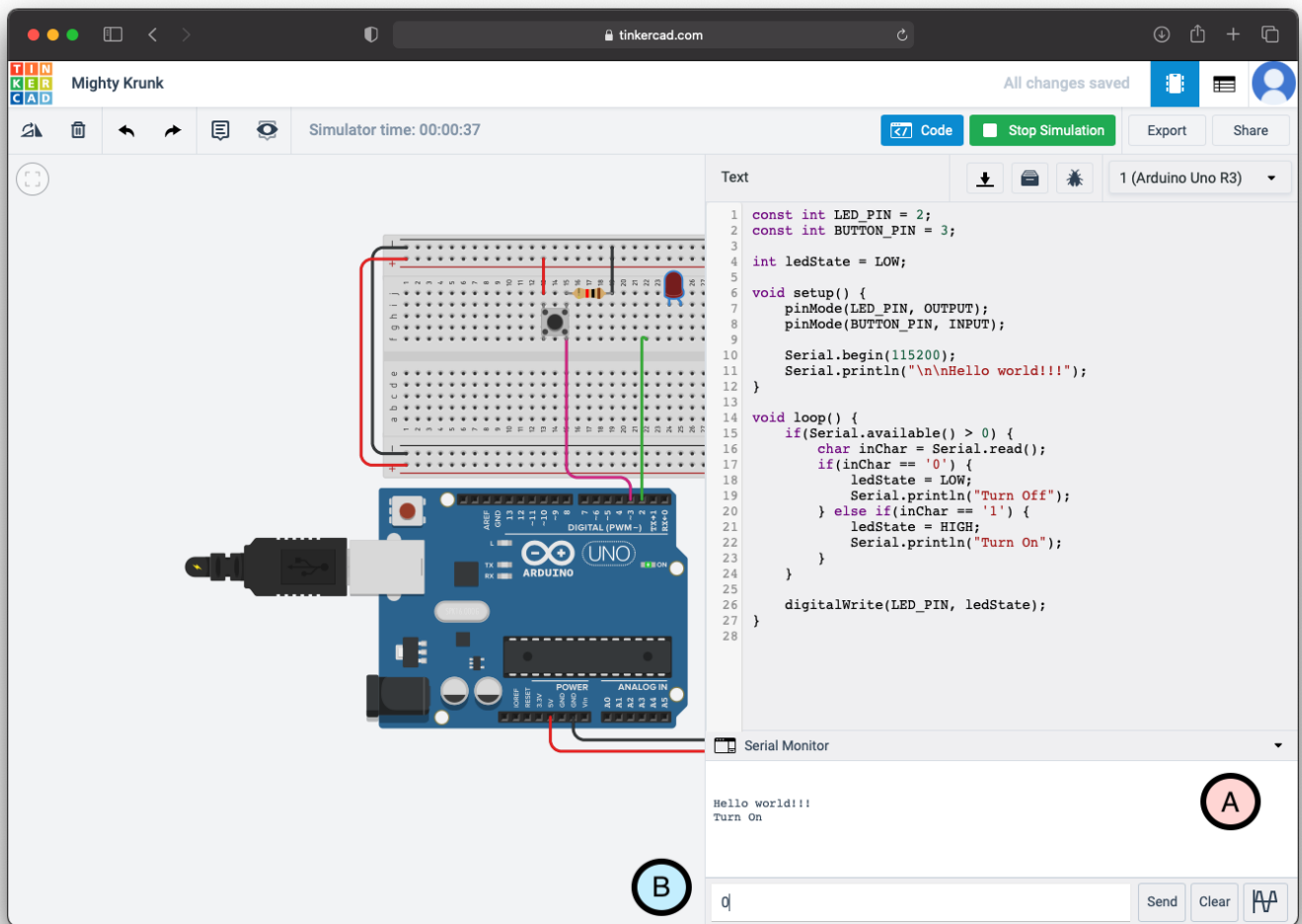
void setup() {
    pinMode(LED_PIN, OUTPUT);
    pinMode(BUTTON_PIN, INPUT);

    Serial.begin(115200);
    Serial.println("\n\nHello world!!!");
}

void loop() {
    if(Serial.available() > 0) {
        char inChar = Serial.read();
        if(inChar == '0') {
            ledState = LOW;
            Serial.println("Turn Off");
        } else if(inChar == '1') {
            ledState = HIGH;
            Serial.println("Turn On");
        }
    }

    digitalWrite(LED_PIN, ledState);
}
```

Note that you can observe the serial output in the Serial Monitor (A) at the bottom of the Code pane. You can also enter input via Serial input (B).



What does “PWM” stand for?

Pulse Width Modulation

Try to control LED level from 0 to 9 by the serial input. You can monitor PWM graph via the oscilloscope.

```

const int LED_PIN = 2;
const int BUTTON_PIN = 3;

int dutyCount = 0;
int currentDuty = 0;

void setup() {
  pinMode(LED_PIN, OUTPUT);
  pinMode(BUTTON_PIN, INPUT);

  Serial.begin(115200);
  Serial.println("\n\nHello world!!!");
}

void loop() {
  if(Serial.available() > 0) {
    char inChar = Serial.read();
    int temp = inChar - '0';
    if(temp >= 0 && temp <= 9) {
      currentDuty = temp;
    } else {

    }
  }

  if(dutyCount%10 < currentDuty) {
    digitalWrite(LED_PIN, HIGH);
  } else {
    digitalWrite(LED_PIN, LOW);
  }
}

```

Write Arduino code to do the following task. Input one digit '1' to '9' as a serial input, dim the LED as that number loops. (1 loop dim set PWM from 0 -> 255 -> 0) Put the code in the answer box.

Example Video Clip: <https://youtu.be/oLsSGaJd38o>

```

const int LED_PIN = 2;
const int BUTTON_PIN = 3;

int dutyCount = 0;
int currentDuty = 0;

void setup() {
  pinMode(LED_PIN, OUTPUT);
  pinMode(BUTTON_PIN, INPUT);

```

```
Serial.begin(115200);
Serial.println("\n\nHello world!!!");
}

void loop() {
  if(Serial.available() > 0) {
    char inChar = Serial.read();
    int temp = inChar - '0';
    if(temp >= 0 && temp <= 9) {
      currentDuty = temp;
    } else {

    }
  }
  dutyCount = (dutyCount+1)%10;  // duty iteration added
  if(dutyCount%10 < currentDuty) {
    digitalWrite(LED_PIN, HIGH);
  } else {
    digitalWrite(LED_PIN, LOW);
  }
}
```