INTERNET OF THINGS – IT134IU

LAB 2

Instructions: Please follow the steps:
1 – Students work in groups. Please answer the questions clearly. Remember to include your name and your student ID.
2 - Each group leader (ONLY the group leader, please!) submits the report in Pdf format and videos before the deadline.

Group Name:			
No	**ID**	**Name**	**No Contribution (0 point)**
1	ITITIU21045	Nguyễn Minh Đức	16%
2	ITITIU21123	Trần Hoàng Thế Bảo	16%
3	ITITIU21217	Đỗ Đức Huy	16%
4	ITITIU21076	Bùi Đức Mạnh	16%
5	ITITIU21347	Phạm Quang Vinh	16%
6	ITITIU20021	Hàng Huỳnh Công Thuận	20%

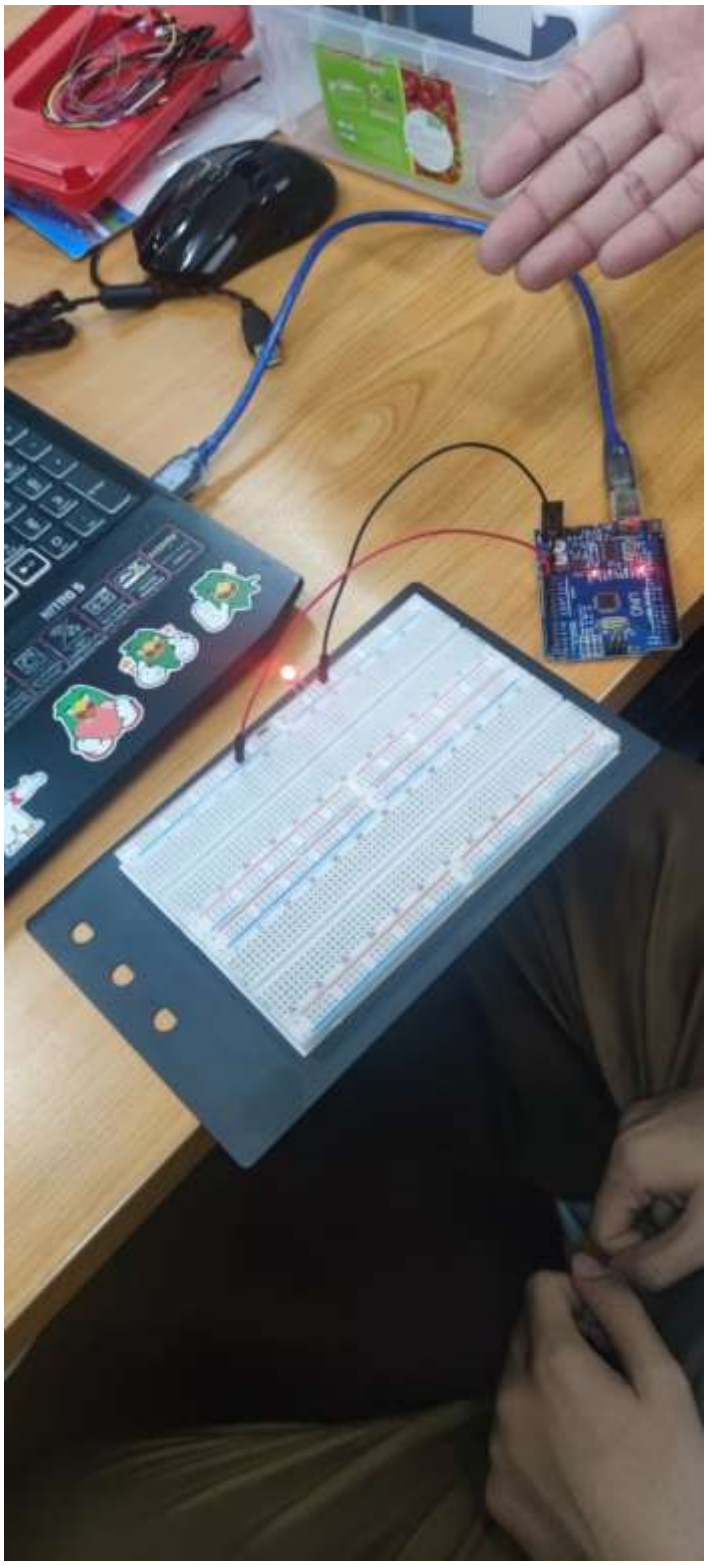
Video of challenges: https://drive.google.com/drive/folders/1B7SVM29-IWRYTBZTvz2-YAQso5D-7qzz

LAB 2

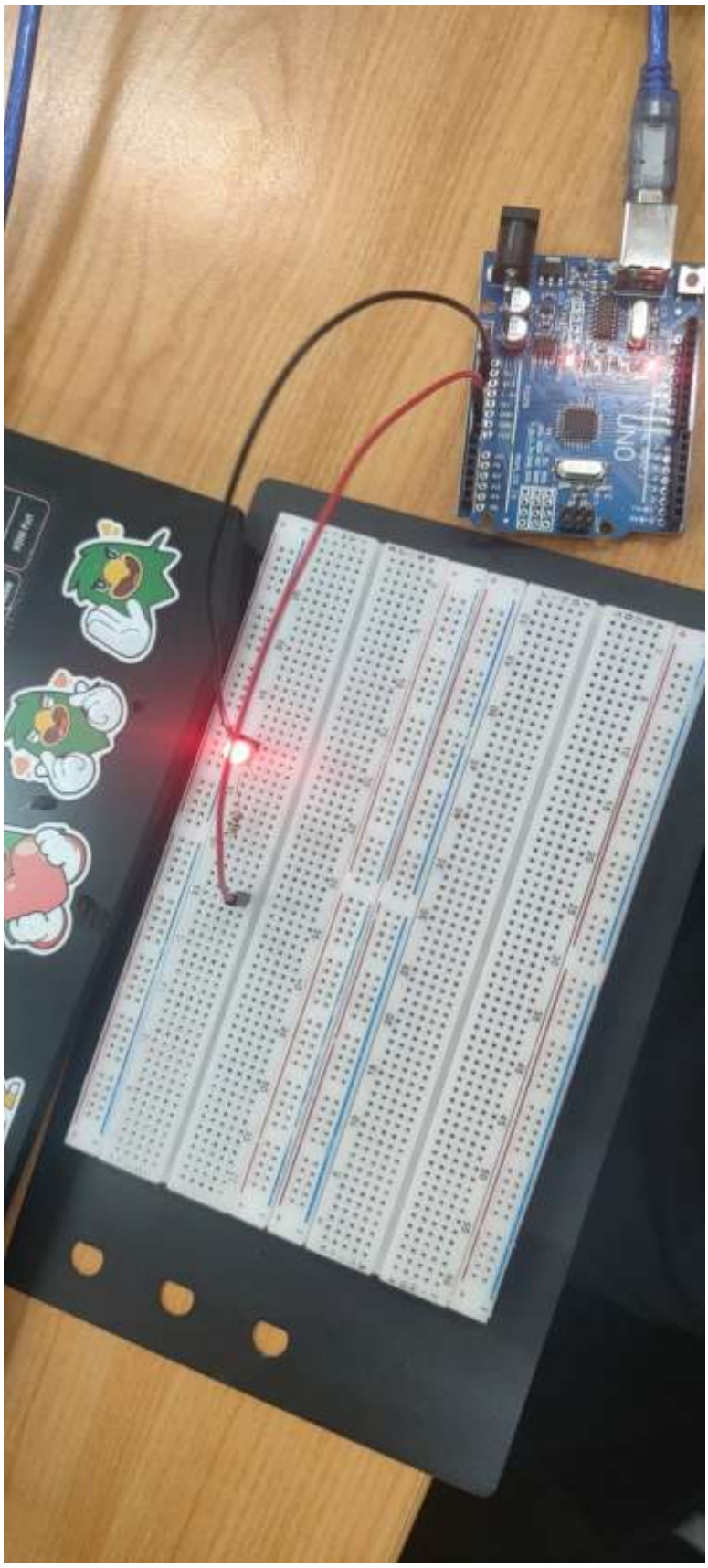
1. Activity 1

Paste the source code here!

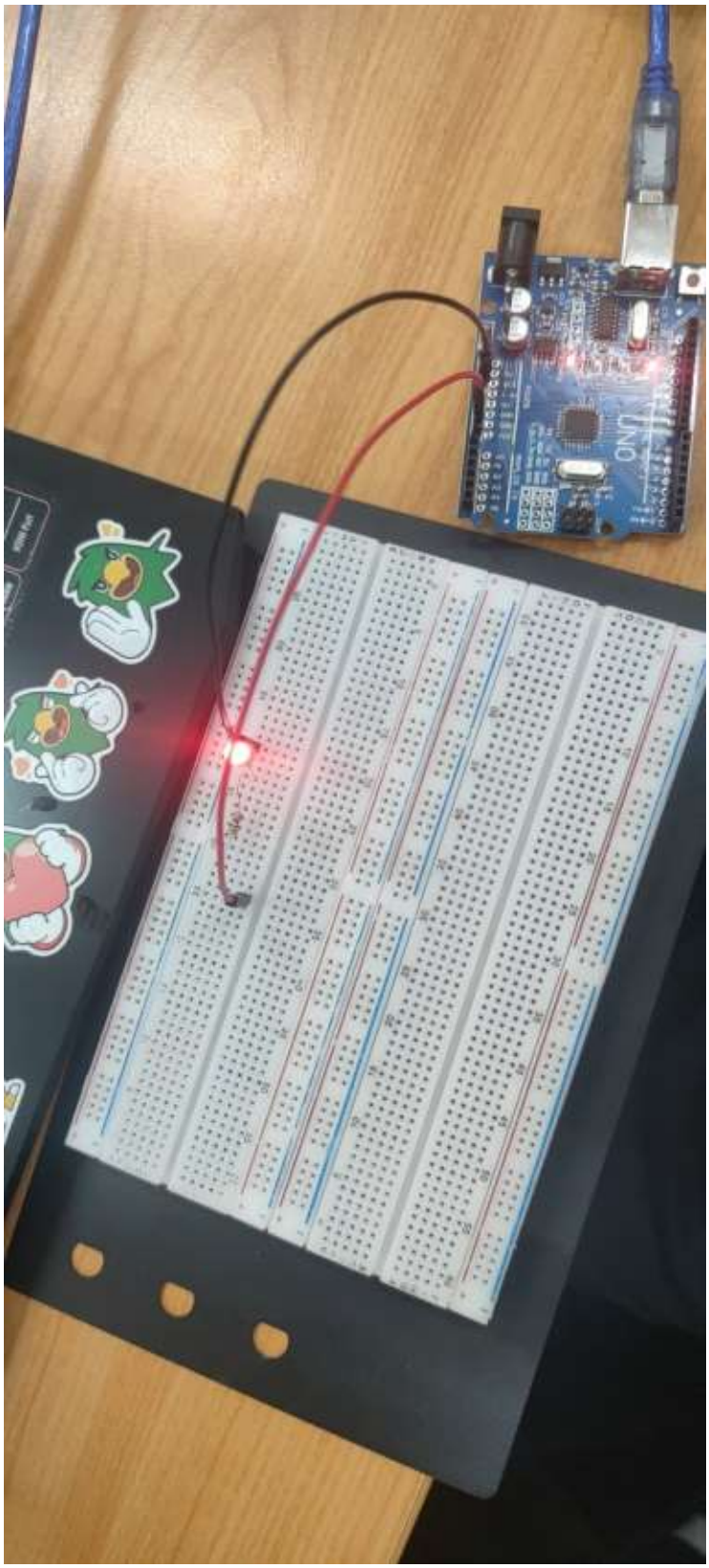
Challenge 1: Connect a LED only to one of two outer sections (the power rails)



Challenge 2: Connect a LED only to one of two inner sections (the wiring rails)



Challenge 3: Connect a LED to one inner section and one outer section



2. Activity 1.5

Paste the source code here!

```
U se the Serial Monitor input to Control the DC Motor


void setup () {

// We define the baud rate to 9600 baud

// And pin 2 as output
  pinMode (2, OUTPUT);

  Serial.begin (9600);

}

  void loop () {

   digitalWrite (2, HIGH);

}
```

3. Activity 2

Paste the source code here!

```
#define LED 13  // assuming the LED is connected to pin 13
#define PIR 2   // assuming the PIR sensor is connected to pin 2




void setup() {
  pinMode(LED, OUTPUT);  // initialize LED as an output
  pinMode(PIR, INPUT);   // initialize sensor as an input
  Serial.begin(9600);    // initialize serial
}


void loop() {
  if (digitalRead(PIR) == HIGH) {  // check if the sensor is HIGH
```

```
    for (int i = 0; i < 3; i++) {
      sosSequence();
    }

    Serial.println("Motion detected!");
    delay(100);  // delay 100 milliseconds
  }
}

void sosSequence() {
  for (int i = 0; i < 3; i++) {
    if (i == 1) {
      digitalWrite(LED, HIGH);  // turn LED ON
      delay(600);               // delay for dot in Morse code
      digitalWrite(LED, LOW);   // turn LED OFF
      delay(200);               // delay between dots and dashes in Morse code
      digitalWrite(LED, HIGH);  // turn LED ON
      delay(600);               // delay for dot in Morse code
      digitalWrite(LED, LOW);   // turn LED OFF
      delay(200);               // delay between dots and dashes in Morse code
      digitalWrite(LED, HIGH);  // turn LED ON
      delay(600);               // delay for dash in Morse code
      digitalWrite(LED, LOW);   // turn LED OFF
      delay(200);
    } else {
      digitalWrite(LED, HIGH);  // turn LED ON
      delay(200);               // delay for dot in Morse code
      digitalWrite(LED, LOW);   // turn LED OFF
```

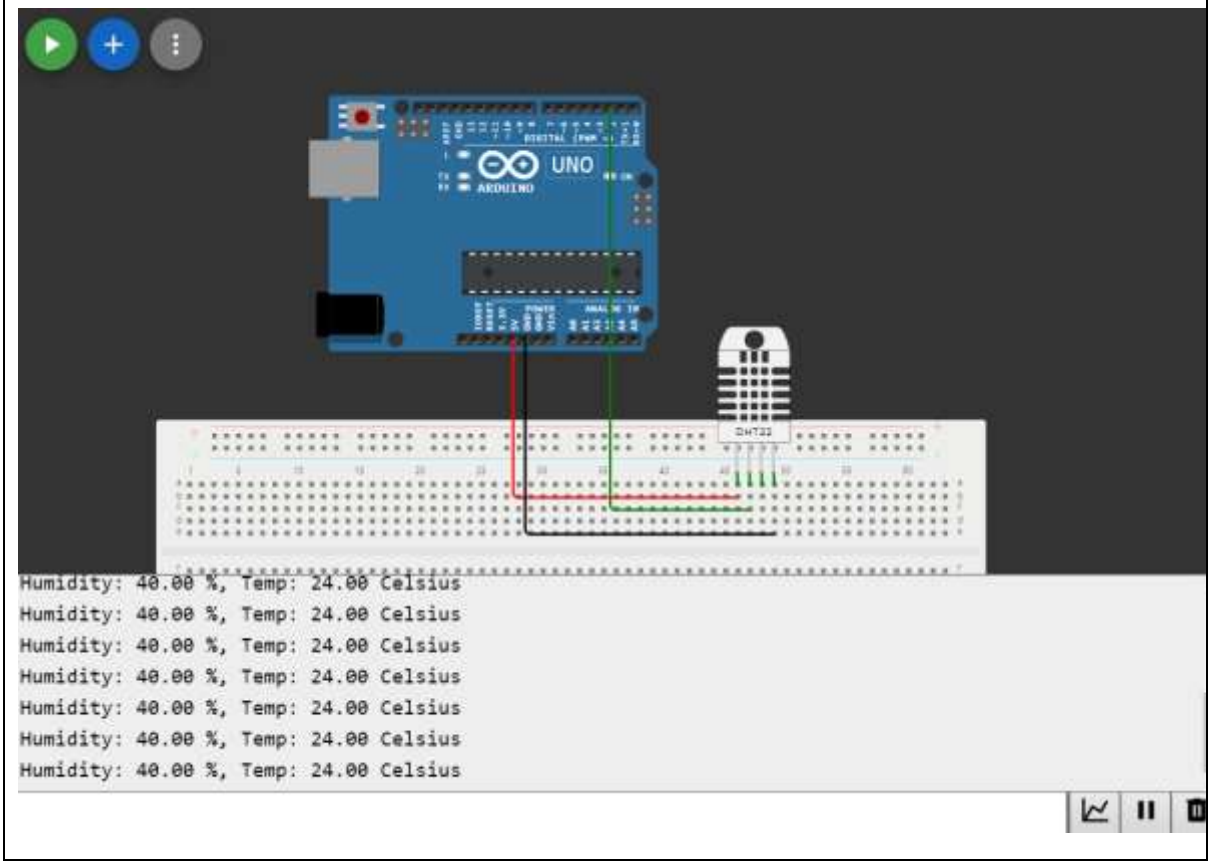
```
    delay(200);             // delay between dots and dashes in Morse code
    digitalWrite(LED, HIGH);  // turn LED ON
    delay(200);             // delay for dot in Morse code
    digitalWrite(LED, LOW);   // turn LED OFF
    delay(200);             // delay between dots and dashes in Morse code
    digitalWrite(LED, HIGH);  // turn LED ON
    delay(200);             // delay for dash in Morse code
    digitalWrite(LED, LOW);   // turn LED OFF
    delay(200);             // delay between characters in Morse code
   }
   delay(600);  // delay between letters in Morse code
  }
}
```

4. Activity 3

Paste the source code here!

```
/* How to use the DHT-22 sensor with Arduino uno
   Temperature and humidity sensor
   More info: http://www.ardumotive.com/how-to-use-dht-22-sensor-en.html
   Dev: Michalis Vasilakis // Date: 1/7/2015 // www.ardumotive.com */

//Libraries
#include <DHT.h>;

//Constants
#define DHTPIN 2     // what pin we're connected to
#define DHTTYPE DHT22   // DHT 22  (AM2302)
DHT dht(DHTPIN, DHTTYPE); //// Initialize DHT sensor for normal 16mhz
Arduino


//Variables
int chk;
float hum;  //Stores humidity value
float temp; //Stores temperature value

void setup()
```

```
{
    Serial.begin(9600);
  dht.begin();

}

void loop()
{
    //Read data and store it to variables hum and temp
    hum = dht.readHumidity();
    temp= dht.readTemperature();
    //Print temp and humidity values to serial monitor
    Serial.print("Humidity: ");
    Serial.print(hum);
    Serial.print(" %, Temp: ");
    Serial.print(temp);
    Serial.println(" Celsius");
    delay(2000); //Delay 2 sec.
}
```



5. Activity 4 (BONUS)

Paste the source code here!

Show all 4 numbers on the segment led

```
/*
 Showing number 0-9 on a Common Anode 7-segment LED display
 Displays the numbers 0-9 on the display, with one second inbetween.
 A
 ---
F | | B
 | G |
 ---
E | | C
 | |
 ---
 D
 This example code is in the public domain.
 */


// Pin 2-8 is connected to the 7 segments of the display.


int pinA = 2;
int pinB = 3;
int pinC = 4;
int pinD = 5;
int pinE = 6;
int pinF = 7;
int pinG = 8;
int D1 = 9;
int D2 = 10;
```

```
int D3 = 11;
int D4 = 12;

// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pins as outputs.
  pinMode(pinA, OUTPUT);
  pinMode(pinB, OUTPUT);
  pinMode(pinC, OUTPUT);
  pinMode(pinD, OUTPUT);
  pinMode(pinE, OUTPUT);
  pinMode(pinF, OUTPUT);
  pinMode(pinG, OUTPUT);
  pinMode(D1, OUTPUT);
  pinMode(D2, OUTPUT);
  pinMode(D3, OUTPUT);
  pinMode(D4, OUTPUT);
}

// the loop routine runs over and over again forever:
void loop() {
  digitalWrite(D1, HIGH);
  digitalWrite(D2, HIGH);
  digitalWrite(D3, HIGH);
  digitalWrite(D4, HIGH);

  for(int l =0; l < 10;l++){
    for(int k =0; k < 10;k++){
```

```
    for(int j =0; j < 10;j++){
      for(int i =0; i < 10;i++){
        // digitalWrite(D1, HIGH);
        // digitalWrite(D2, LOW);
        // digitalWrite(D3, LOW);
        // digitalWrite(D4, LOW);
        showNumber(i);
        delay(500);
      }
    }
  }
}

void showNumber(int num) {
  switch (num) {
    case 0:
      digitalWrite(pinA, LOW);
      digitalWrite(pinB, LOW);
      digitalWrite(pinC, LOW);
      digitalWrite(pinD, LOW);
      digitalWrite(pinE, LOW);
      digitalWrite(pinF, LOW);
      digitalWrite(pinG, HIGH);
      break;
    case 1:
      digitalWrite(pinA, HIGH);
      digitalWrite(pinB, LOW);
```

```
    digitalWrite(pinC, LOW);
    digitalWrite(pinD, HIGH);
    digitalWrite(pinE, HIGH);
    digitalWrite(pinF, HIGH);
    digitalWrite(pinG, HIGH);
    break;
  case 2:
    digitalWrite(pinA, LOW);
    digitalWrite(pinB, LOW);
    digitalWrite(pinC, HIGH);
    digitalWrite(pinD, LOW);
    digitalWrite(pinE, LOW);
    digitalWrite(pinF, HIGH);
    digitalWrite(pinG, LOW);
    break;
  case 3:
    digitalWrite(pinA, LOW);
    digitalWrite(pinB, LOW);
    digitalWrite(pinC, LOW);
    digitalWrite(pinD, LOW);
    digitalWrite(pinE, HIGH);
    digitalWrite(pinF, HIGH);
    digitalWrite(pinG, LOW);
    break;
  case 4:
    digitalWrite(pinA, HIGH);
    digitalWrite(pinB, LOW);
    digitalWrite(pinC, LOW);
```

```
    digitalWrite(pinD, HIGH);
    digitalWrite(pinE, HIGH);
    digitalWrite(pinF, LOW);
    digitalWrite(pinG, LOW);
    break;
  case 5:
    digitalWrite(pinA, LOW);
    digitalWrite(pinB, HIGH);
    digitalWrite(pinC, LOW);
    digitalWrite(pinD, LOW);
    digitalWrite(pinE, HIGH);
    digitalWrite(pinF, LOW);
    digitalWrite(pinG, LOW);
    break;
  case 6:
    digitalWrite(pinA, LOW);
    digitalWrite(pinB, HIGH);
    digitalWrite(pinC, LOW);
    digitalWrite(pinD, LOW);
    digitalWrite(pinE, LOW);
    digitalWrite(pinF, LOW);
    digitalWrite(pinG, LOW);
    break;
  case 7:
    digitalWrite(pinA, LOW);
    digitalWrite(pinB, LOW);
    digitalWrite(pinC, LOW);
    digitalWrite(pinD, HIGH);
```

```
    digitalWrite(pinE, HIGH);
    digitalWrite(pinF, HIGH);
    digitalWrite(pinG, HIGH);
    break;
  case 8:
    digitalWrite(pinA, LOW);
    digitalWrite(pinB, LOW);
    digitalWrite(pinC, LOW);
    digitalWrite(pinD, LOW);
    digitalWrite(pinE, LOW);
    digitalWrite(pinF, LOW);
    digitalWrite(pinG, LOW);
    break;
  case 9:
    digitalWrite(pinA, LOW);
    digitalWrite(pinB, LOW);
    digitalWrite(pinC, LOW);
    digitalWrite(pinD, LOW);
    digitalWrite(pinE, HIGH);
    digitalWrite(pinF, LOW);
    digitalWrite(pinG, LOW);
    break;
 }
}
```

Video of challenges: https://drive.google.com/drive/folders/1B7SVM29-IWRYTBZTvz2-YAQso5D-7qzz