Prática 03

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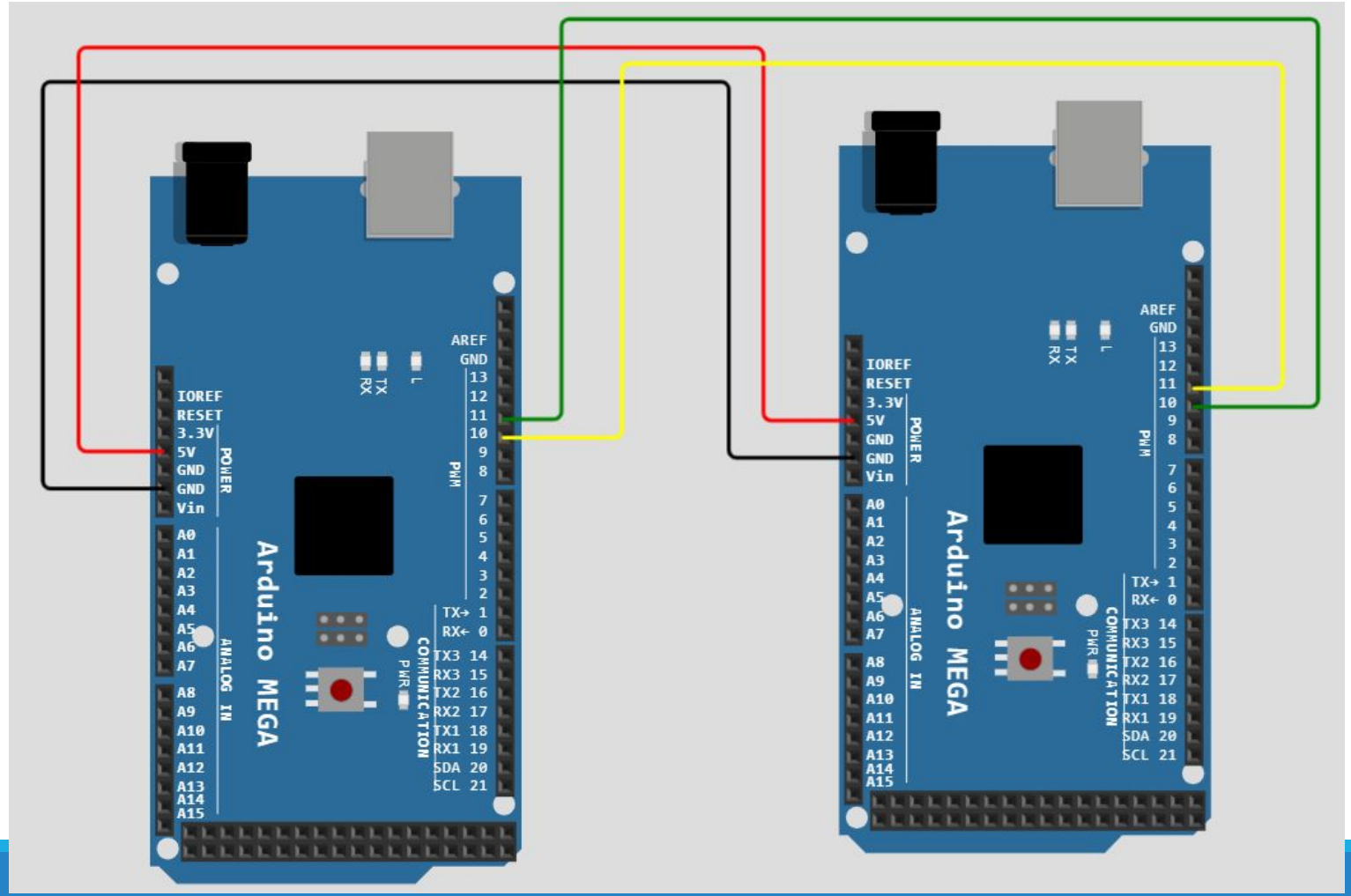
Comunicação serial entre 2 Arduinos



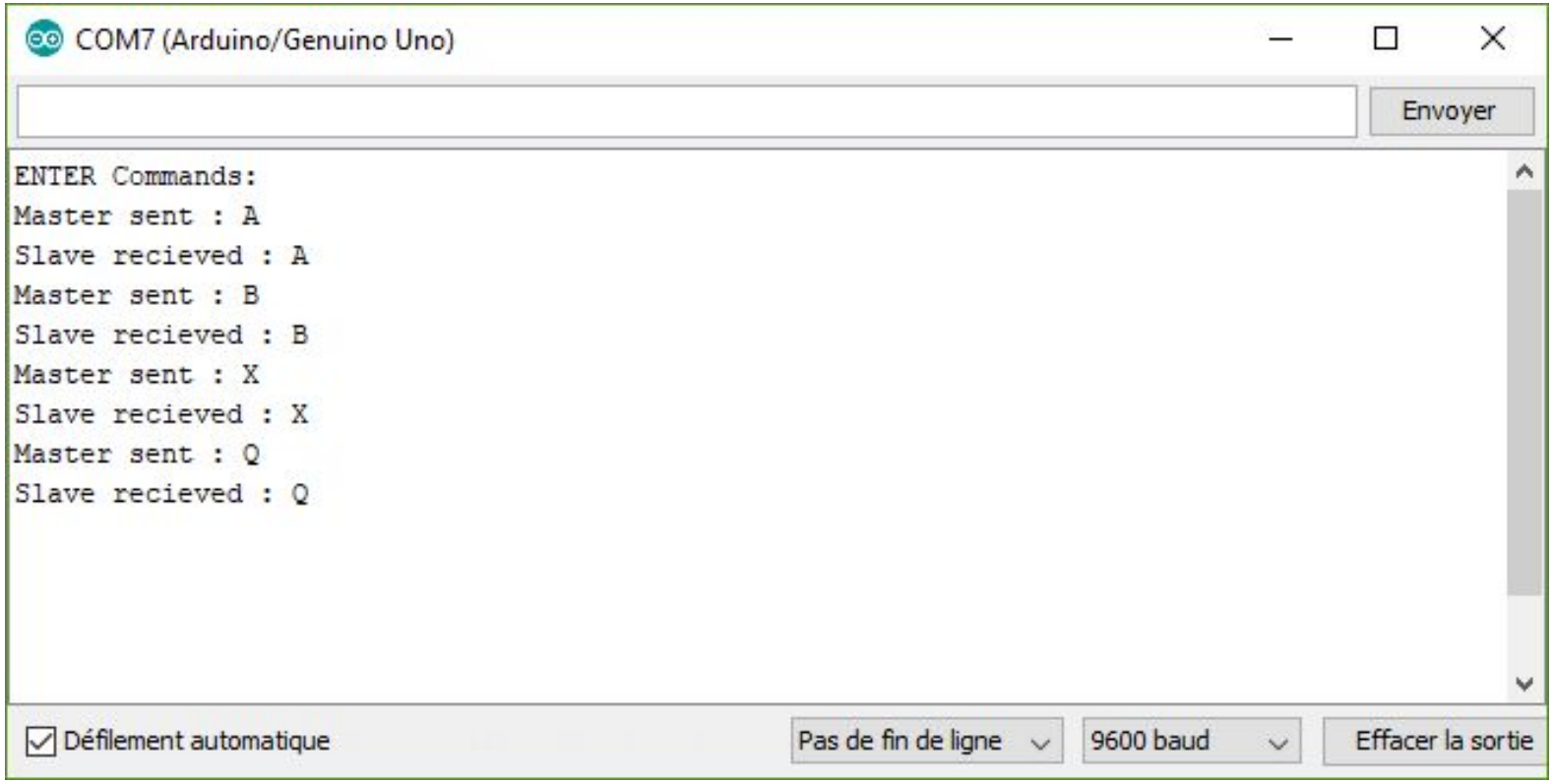
Código placa mestre

```
#include <SoftwareSerial.h>
SoftwareSerial ArduinoSlave(10,11);
char cmd="";
char old_cmd;
char answer="";
char old_answer;
void setup(){
  Serial.begin(9600);
  Serial.println("ENTER Commands:");
  ArduinoSlave.begin(9600);
}
void loop(){
  old_cmd=cmd;
  old_answer=answer;
  //Read command from monitor
  if (Serial.available()){
    cmd=Serial.read();
  }
  //Read answer from slave
  if (ArduinoSlave.available()){
    answer=ArduinoSlave.read();
  }
  //Send data to slave
  if(cmd!=old_cmd){
    Serial.print("Master sent : ");
    Serial.println(cmd);
    ArduinoSlave.write(cmd);
  }
  //Send answer to monitor
  if(answer!=old_answer){
    Serial.print("Slave received : ");
    Serial.println(answer);
  }
}
```

Código escravo

```
1  #include <SoftwareSerial.h>
2  SoftwareSerial ArduinoMaster(10,11);
3  char cmd="";
4  char old_cmd;
5  void setup(){
6    ArduinoMaster.begin(9600);
7  }
8  void loop(){
9    old_cmd=cmd;
10   // Read data from master
11   if (ArduinoMaster.available()){
12     cmd=ArduinoMaster.read();
13   }
14   // Send answer to master
15   if(cmd!=old_cmd){
16     ArduinoMaster.write(cmd);
17   }
18 }
```

Resultado


COM7 (Arduino/Genuino Uno)
Envoyer
ENTER Commands:
Master sent : A
Slave recieved : A
Master sent : B
Slave recieved : B
Master sent : X
Slave recieved : X
Master sent : Q
Slave recieved : Q
Défilement automatique
Pas de fin de ligne
9600 baud
Effacer la sortie

Enviar e receber valores - Mestre

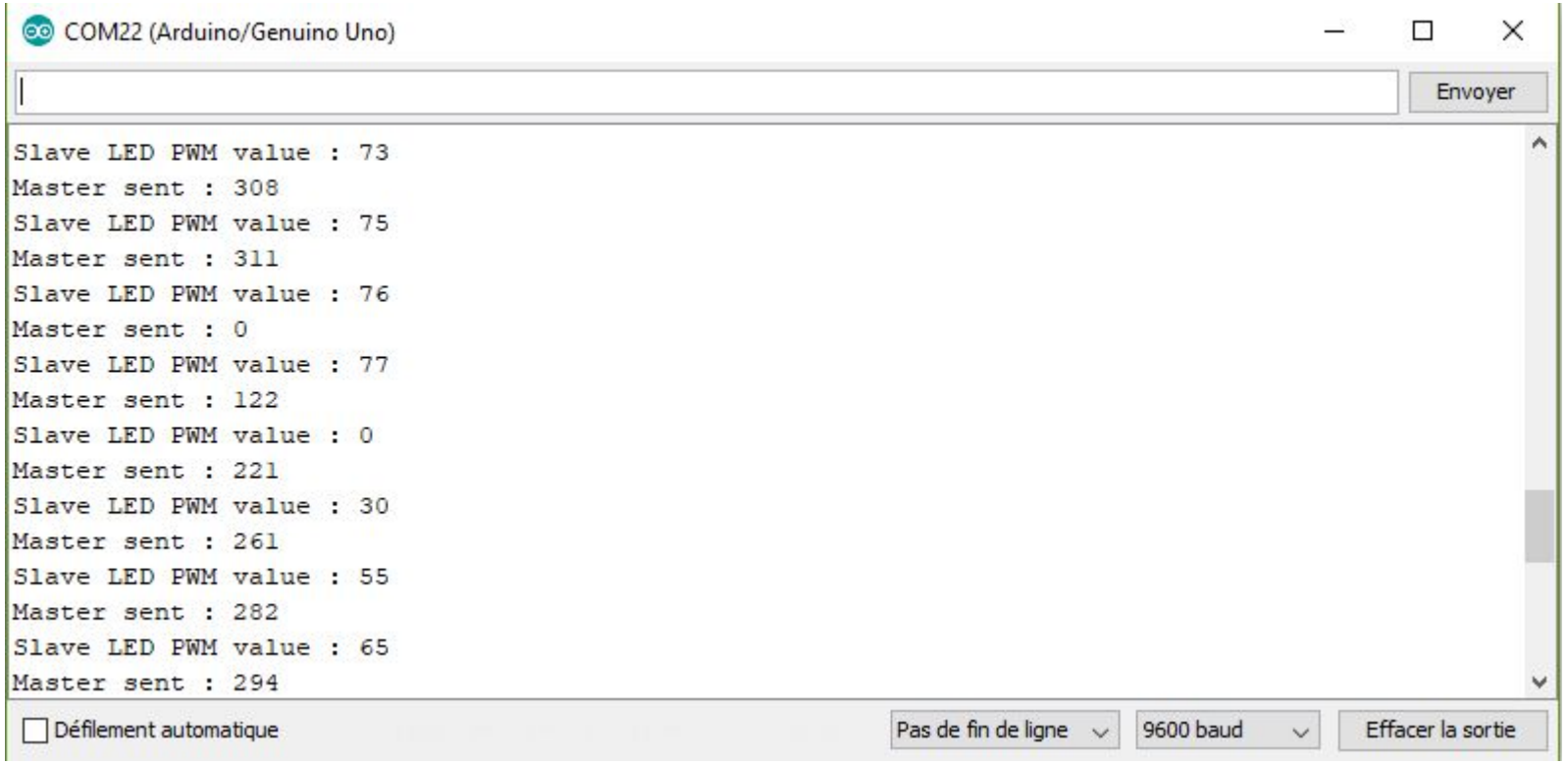
```
#include <SoftwareSerial.h>

SoftwareSerial ArduinoSlave(10,11);
String answer;
String msg;
int intVal=0,oldIntVal=0;

void setup(){

  Serial.begin(9600);
  Serial.println("ENTER Commands:");
  ArduinoSlave.begin(9600);

}

void loop(){
  //Read sensor
  intVal=analogRead(A0);
  //Read answer from slave
  readSlavePort();

  //Send data to slave
  if(oldIntVal!=intVal){
    Serial.print("Master sent : ");
    Serial.println(intVal);
    ArduinoSlave.print(intVal);
    oldIntVal=intVal;
  }
  //Send answer to monitor
  if(answer!=""){
    Serial.print("Slave LED PWM value : ");
    Serial.println(answer);
    answer="";
  }
  delay(1000);
}

void readSlavePort(){
  while (ArduinoSlave.available()) {
   delay(10);
   if (ArduinoSlave.available() >0) {
     char c = ArduinoSlave.read();  //gets one byte from serial buffer
     answer += c; //makes the string readString
   }
 }
}
```

Enviar e receber valores - Escravo

```
#include <SoftwareSerial.h>
SoftwareSerial ArduinoMaster(10,11);
#define ledPin 11
String msg="";
int ledVal=0;
int intVal=0,oldIntVal=0;

void setup(){
  Serial.begin(9600);
  ArduinoMaster.begin(9600);
  pinMode(ledPin,OUTPUT);
}

void loop(){
  readMasterPort();
  convertMsgToCmd();
  // Send answer to master
  if(intVal!=oldIntVal){
    Serial.print("Master sent : " );
    Serial.println(intVal);

    ledVal=map(intVal,0,1023,0,255);
    Serial.print("led value : ");
    Serial.println(ledVal);
    ArduinoMaster.print(ledVal);
    analogWrite(ledPin,ledVal);
    oldIntVal=intVal;
  }
}
```

```
void readMasterPort(){
 while (ArduinoMaster.available()) {
   delay(10);
   if (ArduinoMaster.available() >0) {
     char c = ArduinoMaster.read();  //gets one byte from serial buffer

     msg += c; //makes the string readString
   }
 }
 ArduinoMaster.flush();
}

void convertMsgToCmd(){
   if (msg.length() >0) {
    Serial.print("message length : ");
    Serial.println(msg.length());

     char carrayl[6]; //magic needed to convert string to a number
     msg.toCharArray(carrayl, sizeof(carrayl));
     intVal = atoi(carrayl);

     msg="";
 }
}
```

Resultado


COM22 (Arduino/Genuino Uno)
Envoyer
Slave LED PWM value : 73
Master sent : 308
Slave LED PWM value : 75
Master sent : 311
Slave LED PWM value : 76
Master sent : 0
Slave LED PWM value : 77
Master sent : 122
Slave LED PWM value : 0
Master sent : 221
Slave LED PWM value : 30
Master sent : 261
Slave LED PWM value : 55
Master sent : 282
Slave LED PWM value : 65
Master sent : 294
Défilement automatique
Pas de fin de ligne
9600 baud
Effacer la sortie

Experimento

- Monte em uma protoboard, um arduino que recebe os valores de um sensor de luminosidade e de um botão, e envia os dados via Serial para um outro arduino;
- Este segundo arduino, recebe os dados do botão e do sensor de luminosidade, enquanto o botão esteja pressionado, liga o led na alta intensidade, caso contrário, a luminosidade fica de acordo com o valor do sensor de luminosidade. Caso o valor seja abaixo de 20, imprime na tela: Baixa luminosidade!

Desenvolva seu código!