Solution Travaux dirigés microcontrôleur

**Exercice 1 Exercice 7 et Exercice 6 et Exercice 8**

const int ledPin = 11;

int i = 0;

void setup( )

{

pinMode(ledPin, OUTPUT);

}

void loop()

{

for (i = 0; i < 255; i++)

{

analogWrite(ledPin, i);

delay(10);

}

for (i = 255; i > 0; i--)

{

analogWrite(ledPin, i);

delay(10);

}

}

**Avec capteur**

int DACout; // DAC output

double Vref = 5.0; // reference voltage of the DAC

double Vin; // input voltage from the TMP36

double Tin; // corresponding input temperature

void setup(){

// set up and start the serialport:

Serial.begin(9600);

}

void loop(){

// DAC output to analog input A0

DACout = analogRead(A0);

// output voltage of the TMP36

Vout = DACout \* (Vref \* 1000.0)/1024.0;

// the corresponding temperature

T = (Vout - 500.0) / 10.0;

Serial.println(T);

}

const int ledPin = 11;

const int motor = 10;

int DACout; // DAC output

double Vref = 5.0; // reference voltage of the DAC

double Vout; // input voltage from the TMP36

double T; // corresponding input temperature

void setup(){

// set up and start the serial port:

Serial.begin(9600);

pinMode(ledPin, OUTPUT);

}

void loop(){

// DAC output to analog input A0

DACout = analogRead(A1);

// output voltage of the TMP36

Vout = DACout \* (Vref \* 1000.0)/1024.0;

// the corresponding temperature

T = (Vout - 500.0) / 10.0;

Serial.println(T);

if(T<= 25){

analogWrite( motor,75);

digitalWrite( ledPin,LOW);}

else if (25<T && T< 35)

{ digitalWrite( ledPin,HIGH);

analogWrite( motor,150);}

else

{ analogWrite( motor,255);

digitalWrite( ledPin,LOW);}

}

**Solution avec map ()**

/\* Map an analog value to 8 bits (0 to 255) \*/

void setup() {}

void loop() {

int val = analogRead(0);

val = map(val, 0, 1023, 0, 255);

analogWrite(9, val);

}

**Avec potentiomètre**

const int ledPin = 11;

const int motor = 10;

int val ;

/\* Map an analog value to 8 bits (0 to 255) \*/

void setup() {pinMode(ledPin, OUTPUT);

pinMode(motor, OUTPUT);}

void loop() {

int val = analogRead(A0);

val = map(val, 0, 1023, 0, 255);

analogWrite(motor, val);

}

Interruption

Exercice 9

const byte ledPin = 13;

//const byte interruptPin = 2;

const byte interruptPin = 3;

volatile byte state = LOW;

void setup() {

pinMode(ledPin, OUTPUT);

//pinMode(interruptPin, INPUT\_PULLUP);

pinMode(interruptPin, INPUT);

attachInterrupt(digitalPinToInterrupt(interruptPin), blink, CHANGE );

// LOW , CHANGE ,RISING ,FALLING

}

void loop() { digitalWrite(ledPin, state);}

void blink() { state = !state;}

// ARDUINO UNO - IT Externe 0

// Fonction de IT externe 0 (broche PD2)

ISR(INT0\_vect){

PORTB ^= (1<<PORTB5);

}

void setup(){

//Configuration PORTB.5

DDRB |= B100000; // PB5 en sortie

PORTB &= ~(1<<PORTB5); // PORTB.5 <-0

// Configuration PORTD.2/INT0

DDRD &= B11111011; // PD2 en entrée

PORTD |= (1<<PORTD2); // PORTD.2=1

// active pull-up

EIMSK |= 1; //IT INT0 prise en compte

EICRA = B10; // IT = front négatif sur PD2

sei(); // activation des IT (SREG.7=1)

}

void loop() { // aucun traitement }

EEPROM

#include <EEPROM.h>

const byte ledPin = 13;

volatile byte state = LOW;

void setup() {

Serial.begin(9600);

for (int i = 0; i < 256; i++) {

byte valeur = EEPROM.read(i);

Serial.print(i);

Serial.print(" = ");

Serial.println(valeur);

}}

void loop() {

for (int i = 0; i < EEPROM.length(); i++) {

EEPROM.write(i, 0);

}

digitalWrite(ledPin, HIGH);

}