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// Technik AG - LED Tower - Mikrofon und Audio Eingang - LM368 + LM358 Verstärker
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const int sensitivityPin = A5; // Analoger Eingang des Poti P2
const int audioPin = A0;      // Analoger Eingang des Audiosignals
const int ledCount = 11;     // Anzahl der LED-Ausgänge
const int numReadings = 20;  // Anzahl der abgefragten Datensätze
const int buttonPin = 13;

int counter=0;
int audioValue;              // Analogwert auslesen vom Audioeingang
int maxAudioValue = 0;      // Maximum Analogwert
int sensitivityValue;       // Auslesen des analogen Eingangs zur Audoverstärkung
int ledLevel;               // Ausgabewert Zuordnung zu den LED
int readings[numReadings];  // Auslesen der Datensätze
int index = 0;              // Index der aktuellen Dateneingangs
int total = 0;              // laufende Datenmenge
int average = 0;           // durchschnittliche Datenmenge
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void setup()
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{
  pinMode(buttonPin, INPUT); // Taster T1 ist ein Eingang
  Serial.begin(9600);
  Serial.println("Program start.");
  for (int thisReading = 0; thisReading < numReadings; thisReading++)
    readings[thisReading] = 0;
}
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void loop()
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{
  if(digitalRead(buttonPin) == HIGH ){counter++;delay(200);}

  if( counter == 1){
    Serial.println("Mode 1");
    int ledPins[] = {12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2};
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
      pinMode(ledPins[thisLed], OUTPUT);
    audioValue = analogRead(audioPin);
    if (audioValue > maxAudioValue)maxAudioValue = audioValue;sensitivityValue =
      analogRead(sensitivityPin);ledLevel = map(audioValue, 0, 1023, 0,
      sensitivityValue/2);
    if (ledLevel > ledCount) {ledLevel = ledCount;}
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
      {if (thisLed < ledLevel){digitalWrite(ledPins[thisLed], HIGH);delay (4);}
      else{digitalWrite(ledPins[thisLed], LOW);}}
      delay(2);}

  if (counter == 2) {
    Serial.println("Mode 2");
    int ledPins[] = {2 ,3 ,4 ,5 ,6 ,7 ,8 ,9, 10, 11, 12};
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
      pinMode(ledPins[thisLed], OUTPUT);audioValue = analogRead(audioPin);
    if (audioValue > maxAudioValue)maxAudioValue = audioValue;sensitivityValue =
      analogRead(sensitivityPin);ledLevel = map(audioValue, 0, 1023, 0,
      sensitivityValue/2);
    if (ledLevel > ledCount) {ledLevel = ledCount;}
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
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    {if (thisLed < ledLevel){digitalWrite(ledPins[thisLed], HIGH);delay (10);}
    else digitalWrite(ledPins[thisLed], LOW);}
    delay(2);}

if (counter == 3) {
    Serial.println("Mode 3");
    int ledPins[] = {12,2,11,3,10,4,9,5,8,6,7};
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
        pinMode(ledPins[thisLed], OUTPUT);audioValue = analogRead(audioPin);
    if (audioValue > maxAudioValue)maxAudioValue = audioValue;sensitivityValue =
        analogRead(sensitivityPin);ledLevel = map(audioValue, 0, 1023, 0,
            sensitivityValue/2);
    if (ledLevel > ledCount) {ledLevel = ledCount;}
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
        {if (thisLed < ledLevel){digitalWrite(ledPins[thisLed],LOW);delay (10);}
        else digitalWrite(ledPins[thisLed], HIGH);}
    delay(1);}

if (counter == 4) {
    Serial.println("Mode 4");
    int ledPins[] = {12,2,11,3,10,4, 9,5,8,6,7};
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
        pinMode(ledPins[thisLed], OUTPUT);audioValue = analogRead(audioPin);
    if (audioValue > maxAudioValue)maxAudioValue = audioValue;sensitivityValue =
        analogRead(sensitivityPin);ledLevel = map(audioValue, 0, 1023, 0,
            sensitivityValue/2);
    if (ledLevel > ledCount) {ledLevel = ledCount;}
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
        {if (thisLed < ledLevel){digitalWrite(ledPins[thisLed], HIGH);delay (10);}
        else digitalWrite(ledPins[thisLed], LOW);}
    delay(1);}

if (counter == 5) {
    Serial.println("Mode 5");
    int ledPins[] = {11,9,7,5,3,12,10,8,6,4,2};
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
        pinMode(ledPins[thisLed], OUTPUT);audioValue = analogRead(audioPin);
    if (audioValue > maxAudioValue)maxAudioValue = audioValue;sensitivityValue =
        analogRead(sensitivityPin);ledLevel = map(audioValue, 0, 1023, 0,
            sensitivityValue/2);
    if (ledLevel > ledCount) {ledLevel = ledCount;}
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
        {if (thisLed < ledLevel){digitalWrite(ledPins[thisLed], HIGH);delay (10);}
        else digitalWrite(ledPins[thisLed], LOW);}
    delay(1);}

if (counter == 6) {
    Serial.println("Mode 6");
    int ledPins[] = {12,11, 10, 9, 8, 7, 6, 5, 4, 3, 2};
    total = total - readings[index];
    readings[index] = analogRead(audioPin);
    total= total + readings[index];
    index = index + 1;
    if (index >= numReadings)index = 0; average = total / numReadings; audioValue =
        average;
    if (audioValue > maxAudioValue)maxAudioValue = audioValue;sensitivityValue =
        analogRead(sensitivityPin);ledLevel = map(audioValue, 0, 1023, 0,
            sensitivityValue/2);
    for (int thisLed = 0; thisLed < ledCount; thisLed++)
        {if (thisLed == ledLevel){digitalWrite(ledPins[thisLed], HIGH);}
        else digitalWrite(ledPins[thisLed], LOW); delayMicroseconds(500);}
    delay(1);}

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if( counter == 7){
  Serial.println("Mode 7");
  int ledPins[] = {12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2};
  for (int thisLed = 0; thisLed < ledCount; thisLed++)
    pinMode(ledPins[thisLed], OUTPUT);
  audioValue = analogRead(audioPin);
  if (audioValue > maxAudioValue)maxAudioValue = audioValue;
  sensitivityValue = analogRead(sensitivityPin);
  ledLevel = map(audioValue, 0, 1023, 0, sensitivityValue/2);
  if (ledLevel > ledCount) {ledLevel = ledCount;}
  int thisLed;
  for (thisLed = 0; thisLed < ledCount; thisLed++) {
    if (thisLed < ledLevel)digitalWrite(ledPins[thisLed], HIGH);
    delay(10);}
  for ( thisLed = ledLevel; thisLed >=0; thisLed--){digitalWrite(ledPins[thisLed],
LOW);
delay(10);}

  delay(1);}

if(counter ==8) {
  Serial.println("Stand by mode");
  counter=0;
  int ledPins[] = {12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2};
  for (int thisLed = 0; thisLed < ledCount; thisLed++)
    digitalWrite(ledPins[thisLed], LOW);
}}

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