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int dex = 0;//count receiving numbers.
int dex_1 = 0;
int dexx = 0;
int rece[4000];
int temp[1000];
int v[4];
float f_conv[250];
const byte numChars = 32;
char receivedChars[numChars]; // an array to store the received data
boolean newData = false;
const double a = 25+50*v[0];
int ledPin = 2; //signal sending pin
int interruptPin = 10;//signal receiving pin.
void setup()
{
  Serial.begin(9600);
  pinMode(ledPin, OUTPUT);
  pinMode (interruptPin,INPUT_PULLUP);
  attachInterrupt(digitalPinToInterrupt(interruptPin),receiving,RISING);
  //While there having coming signal from 10 port, receiving function start
  work.
}

void loop()
{
  recvWithEndMarker();
  showNewData();
}

void recvWithEndMarker() {
  static byte ndx = 0;
  char endMarker = '\n';
  char rc;

  while (Serial.available() > 0 && newData == false) {
    rc = Serial.read();

    if (rc != endMarker) {
      receivedChars[ndx] = rc;
      ndx++;
      if (ndx >= numChars) {
        ndx = numChars - 1;
      }
    }
    else {
      receivedChars[ndx] = '\0'; // terminate the string
      ndx = 0;
      newData = true;
    }
  }
}

void showNewData() {

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if (newData == true) {
  Serial.print("This just in ... ");
  Serial.println(receivedChars);

  for(int i = 0; i<4;i++){
    v[i] = receivedChars[i] - '0';
    Serial.print(v[i]);
  }
  Serial.println();
  if(v[0]== v[1] == v[2] == 0 && v[3] == 1){ // Type 0001 to decode and
show received data in HUB.
  Serial.println("Data Transforming . . .");
  deco(rece);
}
PORTD |= B00000100;// digitalWrite(ledPin,HIGH);
delayMicroseconds(25+50*v[0]); //based on 10k signal
PORTD &= B11111011;//digitalWrite(ledPin,LOW);
delayMicroseconds(100-(25+50*v[0]));
PORTD |= B00000100;// digitalWrite(ledPin,HIGH);
delayMicroseconds(25+50*v[1]);
PORTD &= B11111011;//digitalWrite(ledPin,LOW);
delayMicroseconds(100-(25+50*v[1]));
PORTD |= B00000100;//digitalWrite(ledPin,HIGH);
delayMicroseconds(25+50*v[2]);
PORTD &= B11111011;// digitalWrite(ledPin,LOW);
delayMicroseconds(100-(25+50*v[2]));
PORTD |= B00000100;//digitalWrite(ledPin,HIGH);
delayMicroseconds(25+50*v[3]);
PORTD &= B11111011;//digitalWrite(ledPin,LOW);
delayMicroseconds(100-(25+50*v[3]));
delay(50);
newData = false;
// send the correct order to node.
}
}

void receiving(){
  delayMicroseconds(40);//detect the middle point of signal.
  rece[dex]=digitalRead(interruptPin);
  dex++;
}

void deco(int rec[]){

  for(int i = 0 ; i < dex ; i = i + 4 ){
    temp[dexx] = rece[i]*1000+rece[i+1]*100+rece[i+2]*10+rece[i+3];
    dexx++;
  }
  int val[dexx];
  for(int j = 0 ; j < dexx ; j++ ){
    switch (temp[j] - 0000){
      case 0:
        val[j]=0;//convert to 0
        break;

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        case 1:
val[j]=1;//convert to 1
break;
        case 10:
val[j]=2;//convert to 2
break;
        case 11:
val[j]=3;//convert to 3
break;
        case 100:
val[j]=4;//convert to 4
break;
        case 101:
val[j]=5;//convert to 5
break;
        case 110:
val[j]=6;//convert to 6
break;
        case 111:
val[j]=7;//convert to 7
break;
        case 1000:
val[j]=8;//convert to 8
break;
        case 1001:
val[j]=9;//convert to 9
break;
        case -1:
break;
    }
    if((j+1)%4 == 0){
        f_conv[dex_1] = val[j-3]*10 + val[j-2] + val[j-1]*0.1 +
val[j]*0.01;//get the float value.
        dex_1++;
    }
}
Serial.println("Receiving data value is "); //show the data on serial.
for(int k = 0 ; k < dex_1 ; k++){
    Serial.println(f_conv[k]);
}
ini();//initialize array and index number after each converting
}
void ini(){
    int rece[4000];
    int dex = 0;
    int dex_1 = 0;
    int dexx = 0;
    int temp[1000];
    float f_conv[1000];
}
//These codes have not been tested in lab.

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