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//SENSING CURTAIN ARDUINO PROGRAM.
//May 11, 2010 Felecia Davis Final Project New Textiles
//Thanks to Leah Buechley for her assistance with this code.
//This needs to connect to the Arduino Wire Libraries

#include <Wire.h>

#define SLAVEWRT 0x48 // address of device during write cycle
#define SLAVERD 0x48 // address of device during read cycle

unsigned int mySensor = 0; // where capacitive sensor data is kept

int row0 = 9;
int row1 = 10;
int row2 = 11;
int column0 = 12;
int column1 = 13;
int column2 = 14;

void setup()
{

  pinMode(row0, OUTPUT);
  pinMode(row1, OUTPUT);
  pinMode(row2, OUTPUT);
  pinMode(column0, OUTPUT);
  pinMode(column1, OUTPUT);
  pinMode(column2, OUTPUT);

  Wire.begin(); // sets up i2c for operation
  Serial.begin(9600); // set up baud rate for serial

  Wire.beginTransmission(SLAVEWRT); // start i2c cycle
  Wire.send(0xBF); // reset the device
  Wire.endTransmission(); // ends i2c cycle

  Wire.beginTransmission(SLAVEWRT); // begin write cycle
  Wire.send(0x0A); // point to config register
  Wire.send(0x01 | (7 << 3)); // calib. mode, slow sample
  Wire.endTransmission(); // ends cycle

  Wire.beginTransmission(SLAVEWRT); // begin write cycle
  Wire.send(0x07); // cap setup reg
  Wire.send(0x80); // cap enabled

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Wire.endTransmission(); // ends cycle

Wire.beginTransmission(SLAVEWRT); // begin write cycle
Wire.send(0x09); // EXC register
Wire.send(0x08); // EXC source A
Wire.endTransmission(); // ends cycle

Wire.beginTransmission(SLAVEWRT); // begin write cycle
Wire.send(0x0B); // CAPDAC A reg
Wire.send(0x00 | 39); // capdac a is on, offset about 1.2pF
Wire.endTransmission(); // ends cycle

Wire.beginTransmission(SLAVEWRT); // begin write cycle
Wire.send(0x0A); // configuration register
Wire.send(0x01 | (7 << 3)); // continuous mode
Wire.endTransmission(); // ends cycle
}

void loop() // main program begins
{
  Wire.beginTransmission(SLAVERD); // begin read cycle
  Wire.send(0x01); //pointer to first cap data register
  Wire.endTransmission(); // end cycle

  Wire.requestFrom(SLAVERD,4); // reads 4 bytes

  byte data[3];
  int i = 0;
  while(Wire.available())
  {
    char c = Wire.receive();
    data[i] = c;
    i++;
  }
  mySensor = ((data[1]<<8)+data[2]);
  Serial.println(mySensor);
  //delay(1000);
  if (mySensor < 43280)// its just on
  {
    turnOn (0,0);
    //turnOn (1,1);
    //turnOn (2,2);
  }
  else if (mySensor < 43310)// hand 1/4 in away
  {

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    turnOn (0,0);
    turnOn (0,1);
    turnOn (0,2);

    // turnOn (0,2);
    //turnOn(1,1);
    //turnOn(2,0);
}

else if (mySensor < 43360)// hand on
{
    turnOn (0,2);
    turnOn (1,2);
    turnOn (2,2);
    // turnOn (1,0);
    //turnOn (1,1);
    //turnOn (1,2);
    //turnOn (2,0);
    //turnOn (2,1);
    //turnOn (2,2);
}

else if (mySensor <43480 )
{

    turnOn (0,0);
    turnOn (0,1);
    turnOn (0,2);
    turnOn (1,0);
    turnOn (1,1);
    turnOn (1,2);
    turnOn (2,0);
    turnOn (2,1);
    turnOn (2,2);
    //loopLights();
    //turnOn (1,1);
}
} //end of loop

void loopLights()
{
    int x,y;
    for (x=0;x<3;x++)
    {
        for(y=0;y<3;y++)
        {

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        turnOn(x,y);
    }
}
}
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```
void allOff()
{
    digitalWrite(row0, HIGH);
    digitalWrite(row1, HIGH);
    digitalWrite(row2, HIGH);
```

```
    digitalWrite(column0, LOW);
    digitalWrite(column1, LOW);
    digitalWrite(column2, LOW);
}
```

```
void turnOn (int x, int y)
{
    //control rows
    if (x==0)
    {
        digitalWrite(row0, LOW);
    }
    else if (x==1)
    {
        digitalWrite(row1, LOW);
    }
    else if (x==2)
    {
        digitalWrite(row2, LOW);
    }
    //control columns
    if (y==0)
    {
        digitalWrite(column0, HIGH);
    }
    else if (y==1)
    {
        digitalWrite(column1, HIGH);
    }
    else if (y==2)
    {
        digitalWrite(column2, HIGH);
    }
}
```

```
    delay(1);  
    allOff();  
}
```