//This code was written to be easy to understand.
//Code efficiency was not considered.
//Modify this code as you see fit.
//This code will output data to the Arduino serial monitor.
//Type commands into the Arduino serial monitor to control the pH circuit.
//This code was written in the Arduino 1.6.5 IDE
//An Arduino UNO was used to test the code.

#define rx 2
#define tx 3

SoftwareSerial myserial(rx, tx); //define how the soft serial port is going to work.

void setup() {
  Serial.begin(9600);
  myserial.begin(9600);
  inputstring.reserve(10);
  sensorstring.reserve(30);
}

void loop() {
  if (input_stringcomplete) {
    myserial.print(inputstring);
    inputstring = "";
    input_stringcomplete = false;
  }
  if (myserial.available() > 0) {
    char inchar = (char)myserial.read();
    sensorstring += inchar;
    if (inchar == '\r') {
      sensor_stringcomplete = true;
    }
  }
  if (sensor_stringcomplete) {
    Serial.println(sensorstring);
    ph = sensorstring.toFloat();
    if (ph >= 7.0) {
      Serial.println("high");
    }
    if (ph <= 6.999) {
      Serial.println("low");
    }
    sensorstring = "";
    sensor_stringcomplete = false;
  }
}

void serialEvent() {
  char inchar = (char)Serial.read();
  inputstring += inchar;
  if (inchar == '\r') {
    input_stringcomplete = true;
  }
}

//set up the hardware
//set baud rate for the hardware serial port_0 to 9600
//set baud rate for software serial port_3 to 9600
//set aside some bytes for receiving data from the PC
//set aside some bytes for receiving data from Atlas Scientific product
//if a string from the Atlas Scientific product has been received in its entirety
//send that string to the PC's serial monitor
//convert the string to a floating point number so it can be evaluated by the Arduino
//if the pH is greater than or equal to 7.0
//print "high" this is demonstrating that the Arduino is evaluating the pH as a number
//and not as a string
//if the pH is less than or equal to 6.999
//print "low" this is demonstrating that the Arduino is evaluating the pH as a number
//and not as a string
//clear the string:
//reset the flag used to tell if we have received a completed string from the Atlas Scientific product
String inputstring = ""; //a string to hold incoming data from the PC
String sensorstring = ""; //a string to hold the data from the Atlas Scientific product
boolean input_stringcomplete = false; //have we received all the data from the PC
boolean sensor_stringcomplete = false; //have we received all the data from the Atlas Scientific product
float ph; //used to hold a floating point number that is the pH

//we have to include the SoftwareSerial library, or else we can't use it.
//define what pin rx is going to be.
//define what pin tx is going to be.
#include <SoftwareSerial.h>
define rx 2
#define tx 3

//hardware serial port_0 receives a char
//get the char we just received
//add it to the inputString
//if the incoming character is a \r, set the flag
String inputstring = ""; //a string to hold incoming data from the PC
if (input_stringcomplete) {
  char inchar = (char)Serial.read();
  inputstring += inchar;
  if (inchar == '\r') {
    input_stringcomplete = true;
  }
}

//if a string from the PC has been received in its entirety
//send that string to the Atlas Scientific product
//reset the flag
//here we go...
//if we see that the Atlas Scientific product has sent a character.
//get the char we just received
//if the incoming character is a \r, set the flag

//here we go...
//if (myserial.available() > 0) {
  char inchar = (char)myserial.read();
  sensorstring += inchar;
  if (inchar == '\r') {
    sensor_stringcomplete = true;
  }
}

//a string from the Atlas Scientific product has been received in its entirety
//convert the string to a floating point number so it can be evaluated by the Arduino
//if the pH is greater than or equal to 7.0
//print "high" this is demonstrating that the Arduino is evaluating the pH as a number
//and not as a string
//if the pH is less than or equal to 6.999
//print "low" this is demonstrating that the Arduino is evaluating the pH as a number
//and not as a string

//a string from the Atlas Scientific product has been received in its entirety
//convert the string to a floating point number so it can be evaluated by the Arduino
//if the string:
//reset the flag used to tell if we have received a completed string from the Atlas Scientific product

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