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CS 488 Senior Capstone

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This program gets the output from the AtlasScientific sensor

Then converts it into the reading data (integers).

Then compares it with a rough maximum value of the filtered water which is 1000. This value was chosen by me after numerous tests with filtered water in comparison to normal drinking water from the tap.

If the value of "EH" is higher than the acceptable maximum value then the red light comes on indicating that the water is not filtered

Else if the value of "EH" is lower or equal than the acceptable maximum value then the green light comes on indicating that the water is filtered

In this program I used parts of the code that AtlasScientific suggested to use with their conductivity sensor

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#### Libraries

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```
#include <SoftwareSerial.h> //we have to include the SoftwareSerial library, or else we can't use it.
```

/\*\*\*\*\*\*

#### Define the pin for RX and TX

- important note: **RX** is receive, incoming. **TX** is transmitting, outgoing.

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```
#define rx 2 //define what pin rx is going to be.
```

```
#define tx 3 //define what pin Tx is going to be.
```

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

/\*\*\*\*\*\*

#### Creating char array

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```
char EC_data[48]; //we make a 20 byte character array to hold incoming data from the EC.
```

```
char computerdata[20]; //we make a 20 byte character array to hold incoming data from a pc/mac/other.
```

```
byte received_from_computer=0; //we need to know how many characters have been received.
```

```
byte received_from_sensor=0; //we need to know how many characters have been received.
```

```
byte string_received=0; //used to identify when we have received a string from the EC circuit.
```

```

float EC_float=0;          //used to hold a floating point number that is the EC.

char *EC;                 //char pointer used in string parsing

int led = 13;             //LED connected to digital pin 13

/*****

                                Setup.
Set the data rate in bits per second for serial data transmission
Set the digital pin as output
*****/

void setup(){
  Serial.begin(38400);     //enable the hardware serial port
  myserial.begin(38400);  //enable the software serial port
  pinMode(led, OUTPUT);   // sets the digital pin as output

}

/*****

                                Sending data to EC Circuit
*****/

void serialEvent(){       //this interrupt will show when the data is received.
  received_from_computer=Serial.readBytesUntil(13,computerdata,20); //we read the data and count the number of characters
  computerdata[received_from_computer]=0; //we add a 0 in the array after the last character we received.
  myserial.print(computerdata); //we transmit the data received from the serial monitor to the EC Circuit.
  myserial.print('\r');      //all data sent to the EC Circuit must end with a <CR>.
}

/*****

                                Analyzing the coming data and making sure that it is a number
*****/

void loop(){

  if(myserial.available() > 0){ //if we see that the EC Circuit has sent a character.
    received_from_sensor=myserial.readBytesUntil(13,EC_data,48); //we read the data sent from EC Circuit
    EC_data[received_from_sensor]=0; //we add a 0 to the spot in the array just after the last character we received.

    if((EC_data[0] >= 48) && (EC_data[0] <=57)){ //if ec_data[0] is a digit and not a letter
      pars_data();
    }
    else
      Serial.println(EC_data); //if the data from the EC circuit does not start with a number transmit that data to
the serial monitor.
  }
}

```

```

    }
}

/*****
                                     Outputting the "EH" value
*****/
void pars_data(){
int cond = atoi(EC);           //Converting character value into the integer

    EC= strtok(EC_data, ",");           //let's pars the string at each comma.

    Serial.print(" EC : ");           //We now print each value we parsed separately.
    Serial.println(EC);               //this is the EC value.

/*****
                                     Checking if the water is filtered
*****/

Note: by doing cond = atoi(EC); we converted the character value into the integer
*****/
if(cond >1000 ){                // If conductivity value is greater than rough acceptable maximum value

    Serial.print(" Please filter your water ");           // Print "Please filter your water"

    digitalWrite(13,HIGH);           // Turn on the red light
    digitalWrite(12,LOW);           // Turn off the green light

}else{                            // If conductivity value is lower than rough acceptable maximum value

    Serial.print(" It is filtered and good to drink ");           // Print "It is filtered and good to drink"

    digitalWrite(13,LOW);           // Turn on the green light
    digitalWrite(12,HIGH);           // Turn off the red light

}
}
}

```