Interrupts by Jake

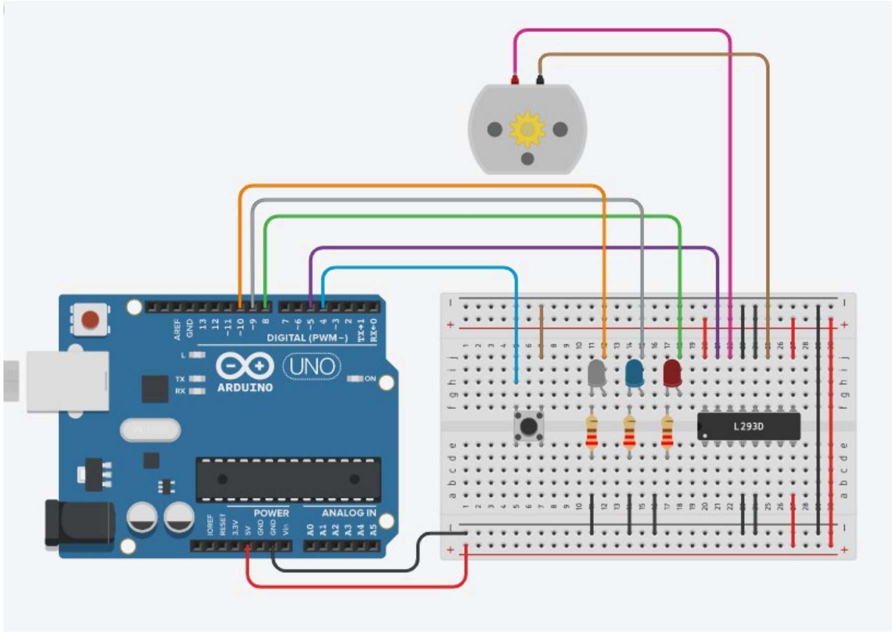
Required components

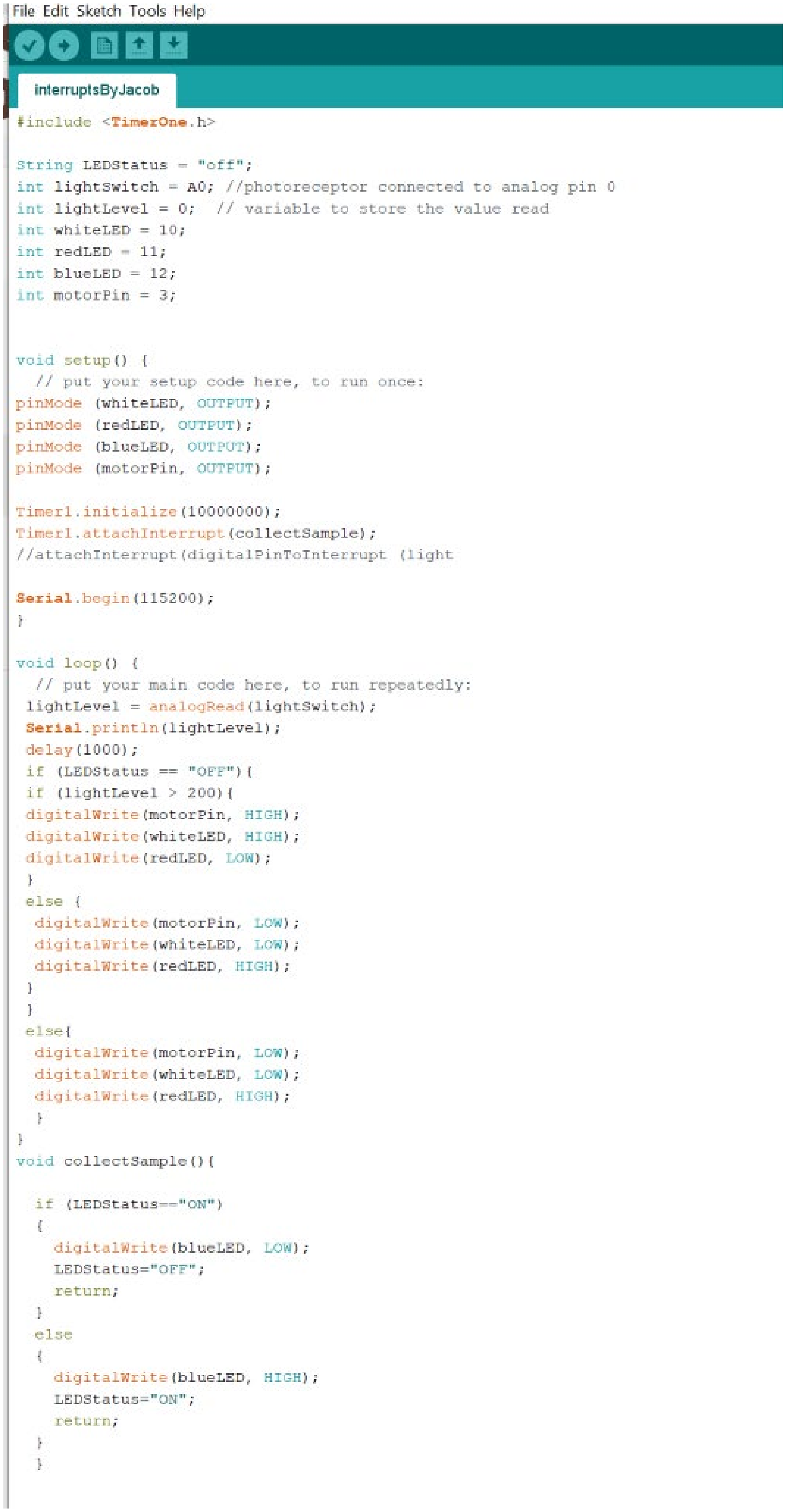
Breadboard
Arduino Uno (or equivalent)
Jumper-wires
DC motor
220ohm resistors
10k ohm resistor
LEDs x3
Photoresistor

Basic idea

Simulating a rover. The 'rover' moves forward and is represented by the white LED being on. While moving forward the DC motor also runs. After a set amount of time it will stop and 'collect samples' represented by the Blue LED. If the photoresistor senses darkness, like if the front of the 'rover' has bumped into something it will stop. This is represented by the red LED being on and the DC motor will stop. In the future I would like to make it so the DC motor spins the other way 'reverse the rover' and have it adjust it course and then go back to the normal move forward and collect samples.

This code is really cool because it lets you check the sensor while simultaneously running the main program. This is accomplished using interrupts. We are able to attach a simple command to our timer, ever time is rolls over a byte of data is sent and analyzed. In this project that byte is the photoreceptor data.





```
#include <TimerOne.h>

String LEDStatus = "off";
int lightSwitch = A0; //photoreceptor connected to analog pin 0
int lightLevel = 0;  // variable to store the value read
int whiteLED = 10;
int redLED = 11;
int blueLED = 12;
int motorPin = 3;


void setup() {
  // put your setup code here, to run once:
pinMode (whiteLED, OUTPUT);
pinMode (redLED, OUTPUT);
pinMode (blueLED, OUTPUT);
pinMode (motorPin, OUTPUT);

Timer1.initialize(10000000);
Timer1.attachInterrupt(collectSample);
//attachInterrupt(digitalPinToInterrupt (light

Serial.begin(115200);
}

void loop() {
  // put your main code here, to run repeatedly:
 lightLevel = analogRead(lightSwitch);
 Serial.println(lightLevel);
 delay(1000);
 if (LEDStatus == "OFF"){
 if (lightLevel > 200){
 digitalWrite(motorPin, HIGH);
 digitalWrite(whiteLED, HIGH);
 digitalWrite(redLED, LOW);
 }
 else {
  digitalWrite(motorPin, LOW);
  digitalWrite(whiteLED, LOW);
  digitalWrite(redLED, HIGH);
 }
 }
 else{
  digitalWrite(motorPin, LOW);
  digitalWrite(whiteLED, LOW);
  digitalWrite(redLED, HIGH);
  }
}
void collectSample(){

  if (LEDStatus=="ON")
  {
    digitalWrite(blueLED, LOW);
    LEDStatus="OFF";
    return;
  }
  else
  {
    digitalWrite(blueLED, HIGH);
    LEDStatus="ON";
    return;
  }
  }
```