

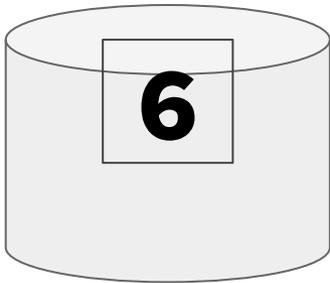
RECAP

1. WE CREATED YOUR 1ST ARDUINO PROGRAM TO CONTROL THE BEHAVIOR OF SOME LEDs BASED ON A SWITCH.

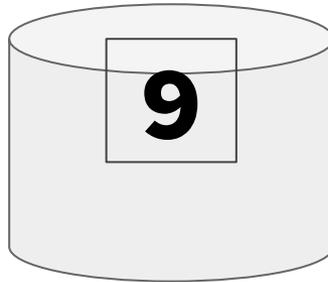
2. WE USED VARIABLES.

INTRODUCING (VARIABLES)

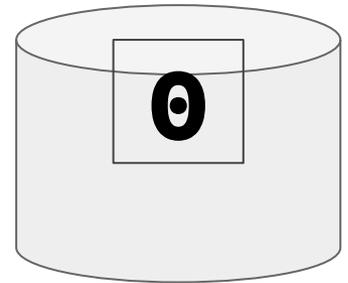
- Imagine variable is like a bucket.
- We can put content into this bucket.
- Each bucket can only contain one item at each time.



```
int bucket = 6;
```



```
int ledPin = 9;
```



```
int value = 0;
```

3. WE USED **IF** ... **ELSE**
STATEMENTS .

```
if the switchState is LOW  
  turn the green LED on  
  turn the red LEDs off
```

```
if the switchState is HIGH  
  turn the green LED off  
  turn the red LEDs on
```

```
if (switchState == LOW) {  
    digitalWrite(3, HIGH);  
    digitalWrite(4, LOW);  
    digitalWrite(5, LOW);  
}  
else {  
    digitalWrite(3, LOW);  
    digitalWrite(4, HIGH);  
    digitalWrite(5, HIGH);  
}
```

4. WE USED

```
digitalRead()
```

TO CHECK THE STATE

OF THE BUTTON

4. WE USED

```
digitalWrite()
```

TO TURN ON OR OFF

THE LEDs.

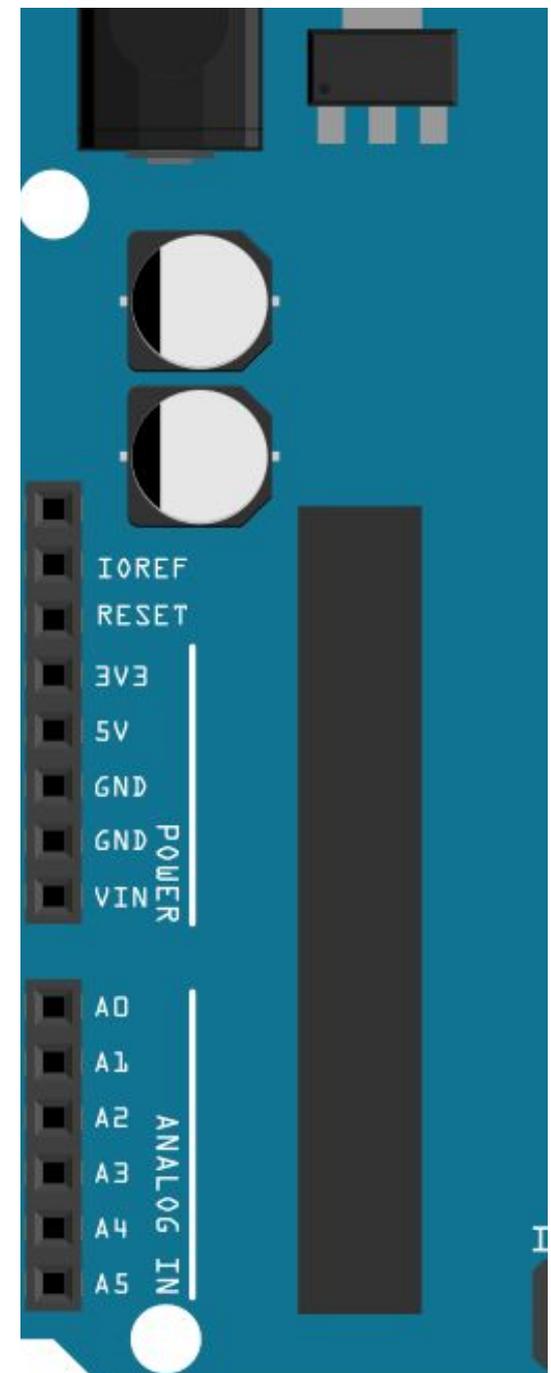
```
void loop() {  
    switchState = digitalRead(2);  
  
    if (switchState == LOW) {  
        digitalWrite(3, HIGH);  
        digitalWrite(4, LOW);  
        digitalWrite(5, LOW);  
    }  
    else {  
        digitalWrite(3, LOW);  
        digitalWrite(4, HIGH);  
        digitalWrite(5, HIGH);  
    }  
}
```

LET THERE

BE LIGHT

WHAT CAN
WE DO WITH
ANALOG IN
(A0 TO A5)
PINS ON
ARDUINO ?

(ANALOG PINS)
PIN A0 TO A5



QUESTION:

WHICH OF THE FOLLOW COMPONENTS CAN
BE USED WITH **ANALOG INPUT PINS**
(A0-A5) ON ARDUINO?



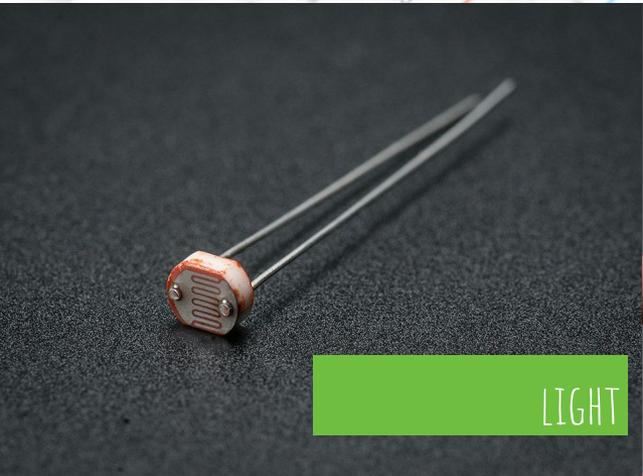
TACTILE SWITCH



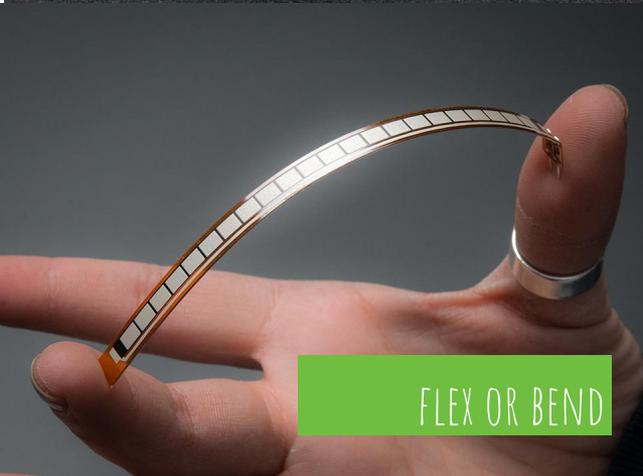
POTENTIOMETER



POTENTIOMETER



LIGHT



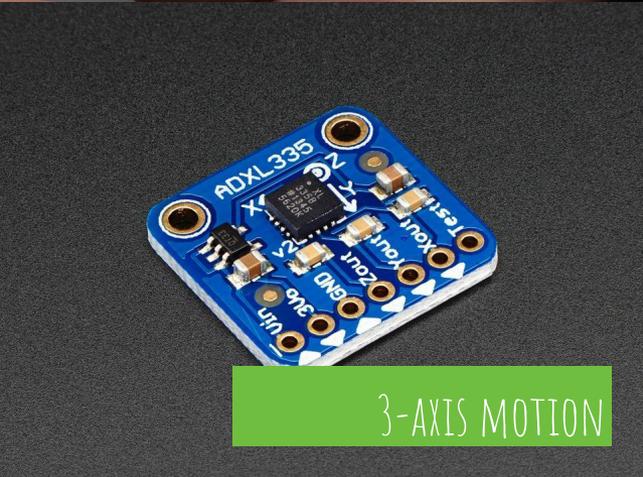
FLEX OR BEND



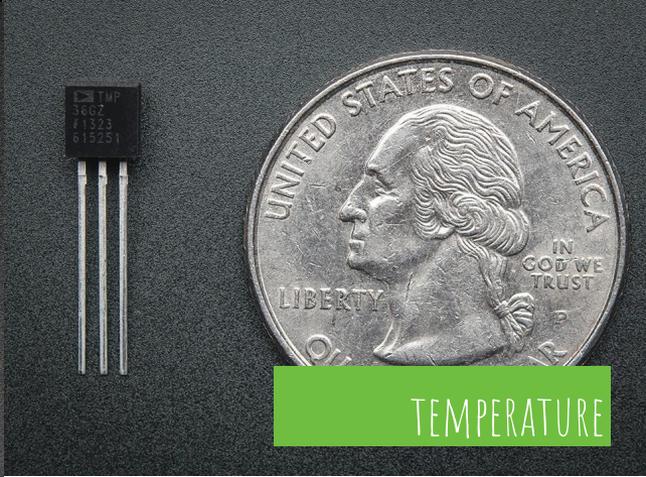
TILT



PRESSURE OR FORCE



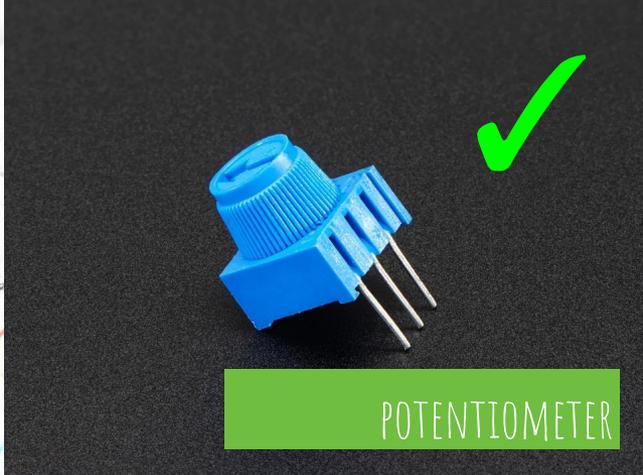
3-AXIS MOTION



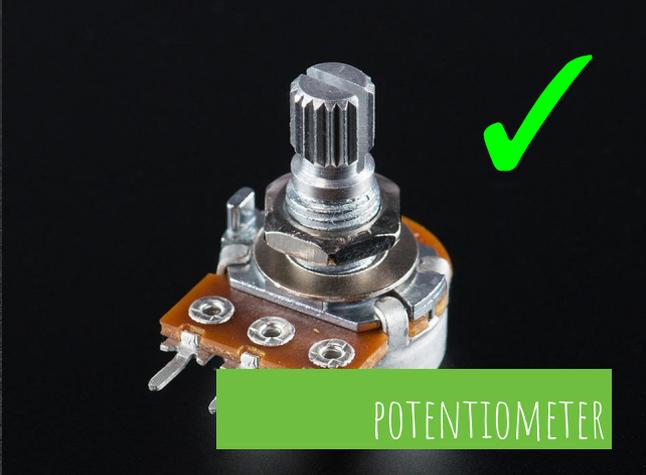
TEMPERATURE



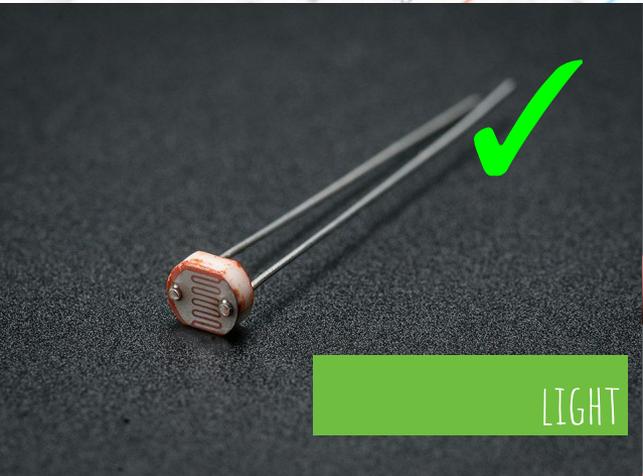
TACTILE SWITCH



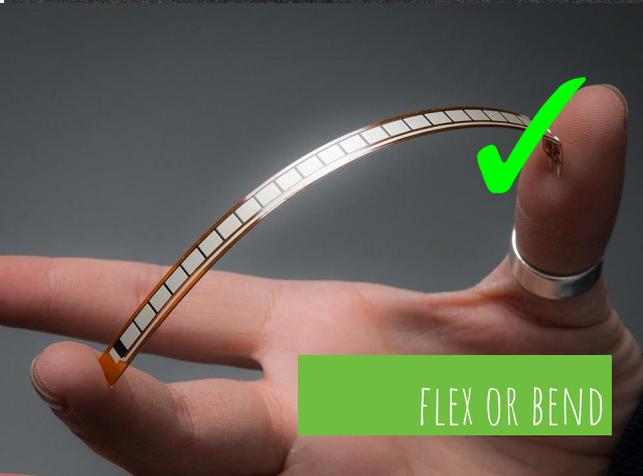
POTENTIOMETER



POTENTIOMETER



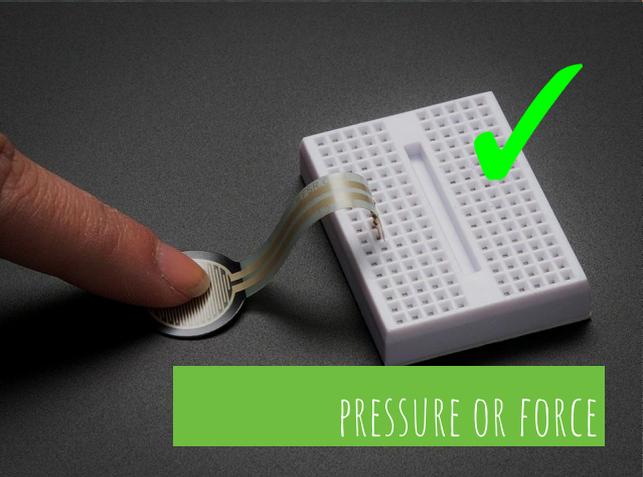
LIGHT



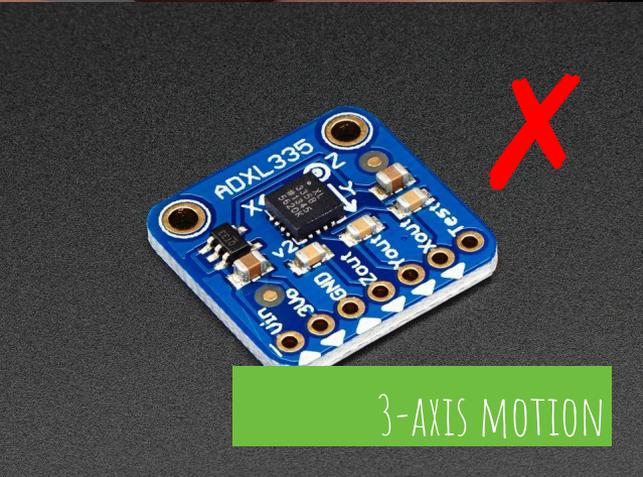
FLEX OR BEND



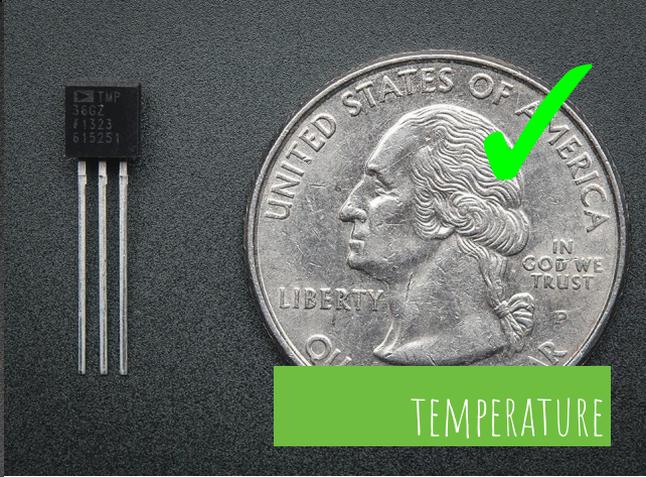
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PRESSURE OR FORCE



3-AXIS MOTION

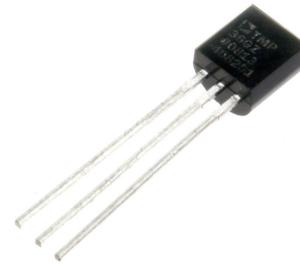


TEMPERATURE

CHALLENGE

HOW DO YOU READ
THE VALUES FROM A
PHOTOCELL ?

USING `ANALOGREAD()` TO READ VALUES FROM `INPUT` SENSORS

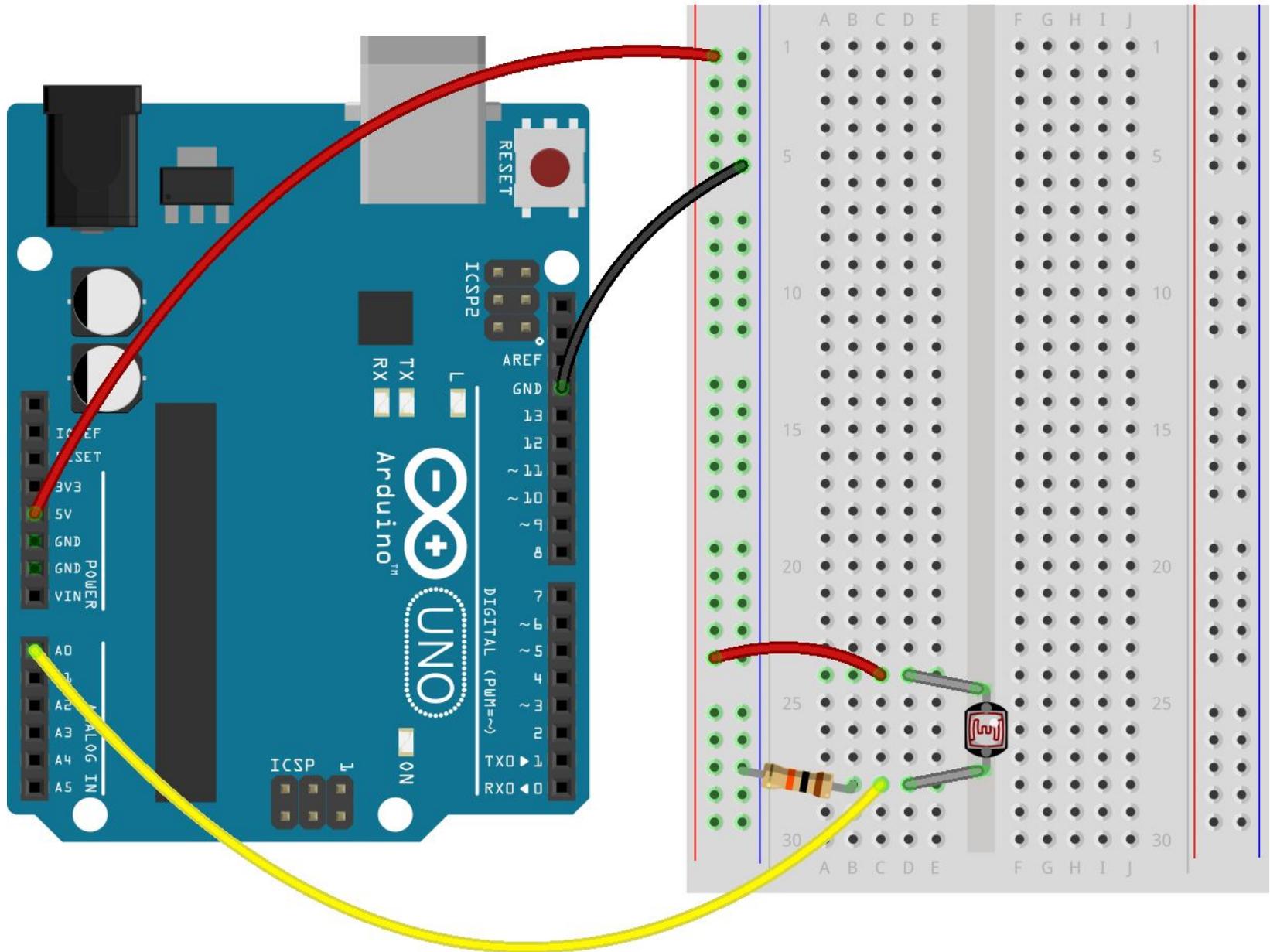


- We can read the values of potentiometer, photocell/photoresistor (light), temperature sensor, force sensor (pressure) etc.

USING SERIAL MONITOR TO CHECK READINGS

- We can use `Serial.println()` to display the values from on photoresistor in Arduino Serial Monitor window. Very useful for checking if your sensors are working.

10k-ohms resistor for photocell (Detecting darkness)
(Brown, Black, Orange, Gold)



```
const int analogPin = A0;
```

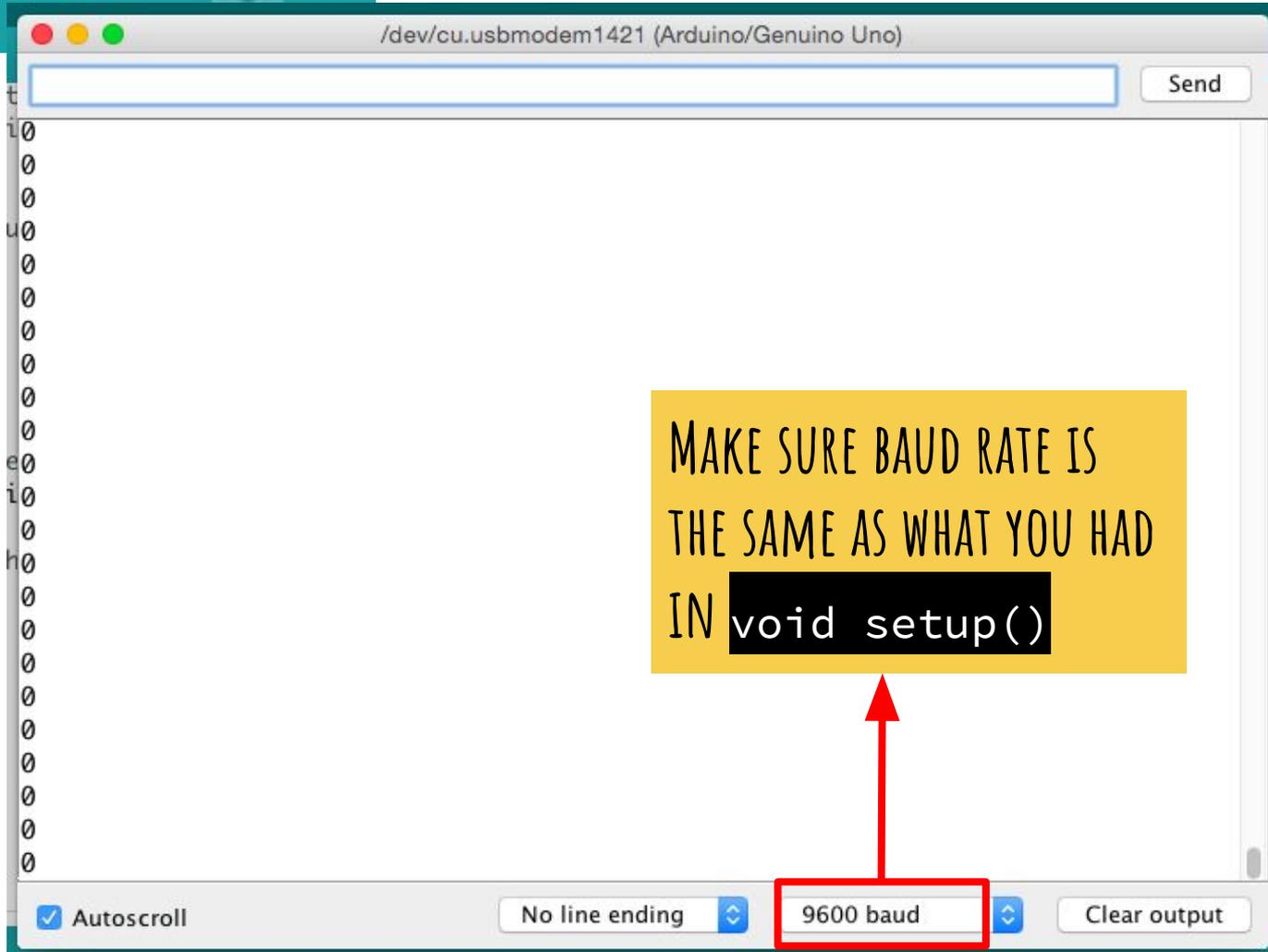
```
void setup() {  
    Serial.begin(9600);  
}
```

```
void loop() {  
    int analogValue =  
    analogRead(analogPin);  
    Serial.println(analogValue);  
    delay(1);  
}
```

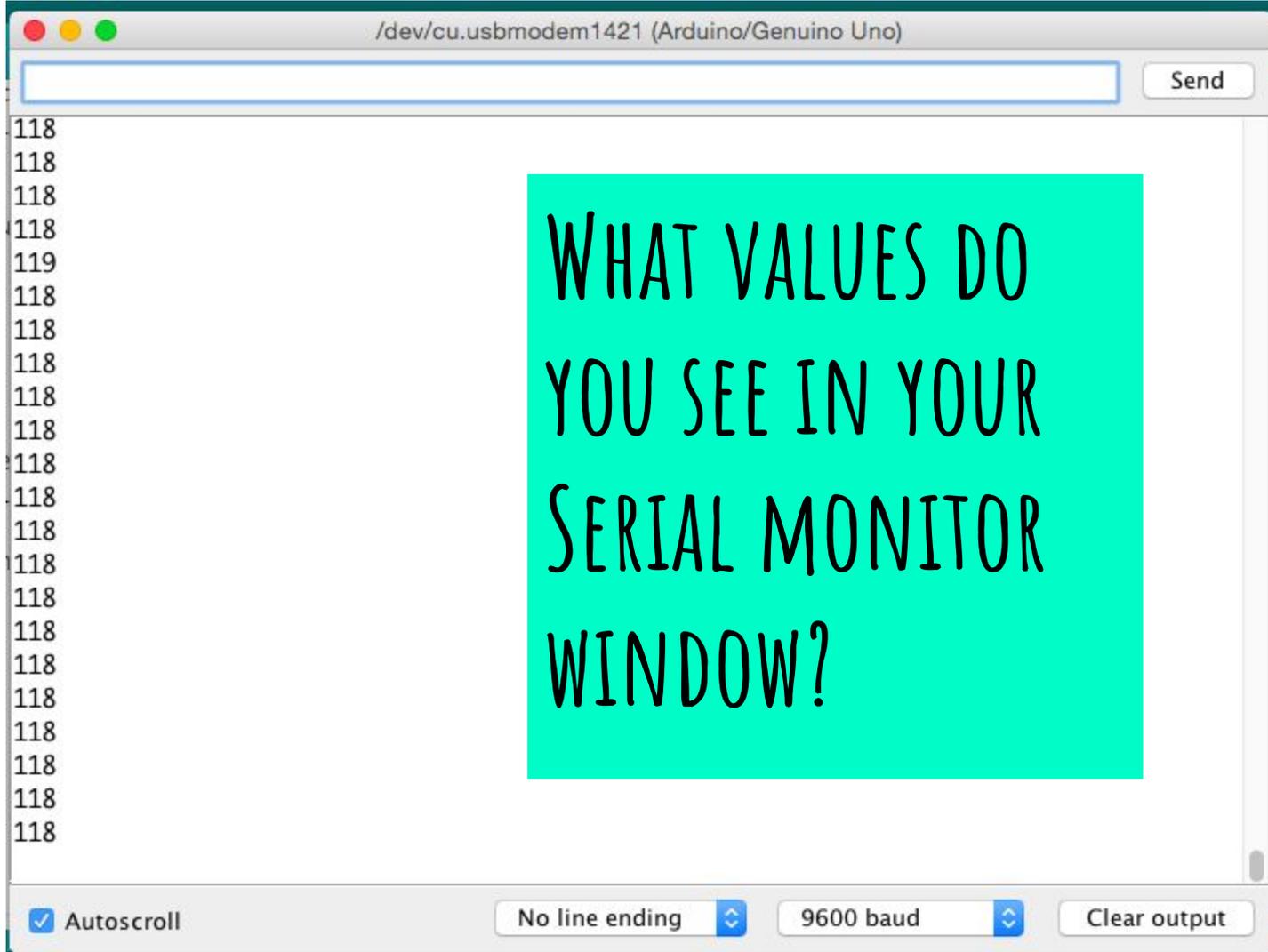
Serial Monitor



Click to open
Serial Monitor Window



MAKE SURE BAUD RATE IS
THE SAME AS WHAT YOU HAD
IN `void setup()`



118
118
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118

WHAT VALUES DO
YOU SEE IN YOUR
SERIAL MONITOR
WINDOW?

Autoscroll

No line ending

9600 baud

Clear output

1. WE USE `Serial.println()`

TO CHECK READINGS FROM

YOUR PHOTOCELL IN THE

SERIAL MONITOR

CHALLENGE

HOW DO TURN A LED
ON WHEN THE ROOM
IS **DARK** ?

CHALLENGE

HOW DO TURN A LED
OFF WHEN THE ROOM
IS **BRIGHT** ?

HOW WOULD YOU BUILD
YOUR CIRCUIT WITH AN
ADDITIONAL LED?

LET'S WRITE SOME

PSEUDO CODE

CLOSER TO HUMAN LANGUAGE

USE **IF** ... **ELSE** STATEMENTS

```
if analogValue is less than 400  
  turn LED on
```

```
if analogValue is more than 400  
  turn LED off
```

```
if analogValue is less than 400  
    turn LED on
```

```
else  
    turn LED off
```

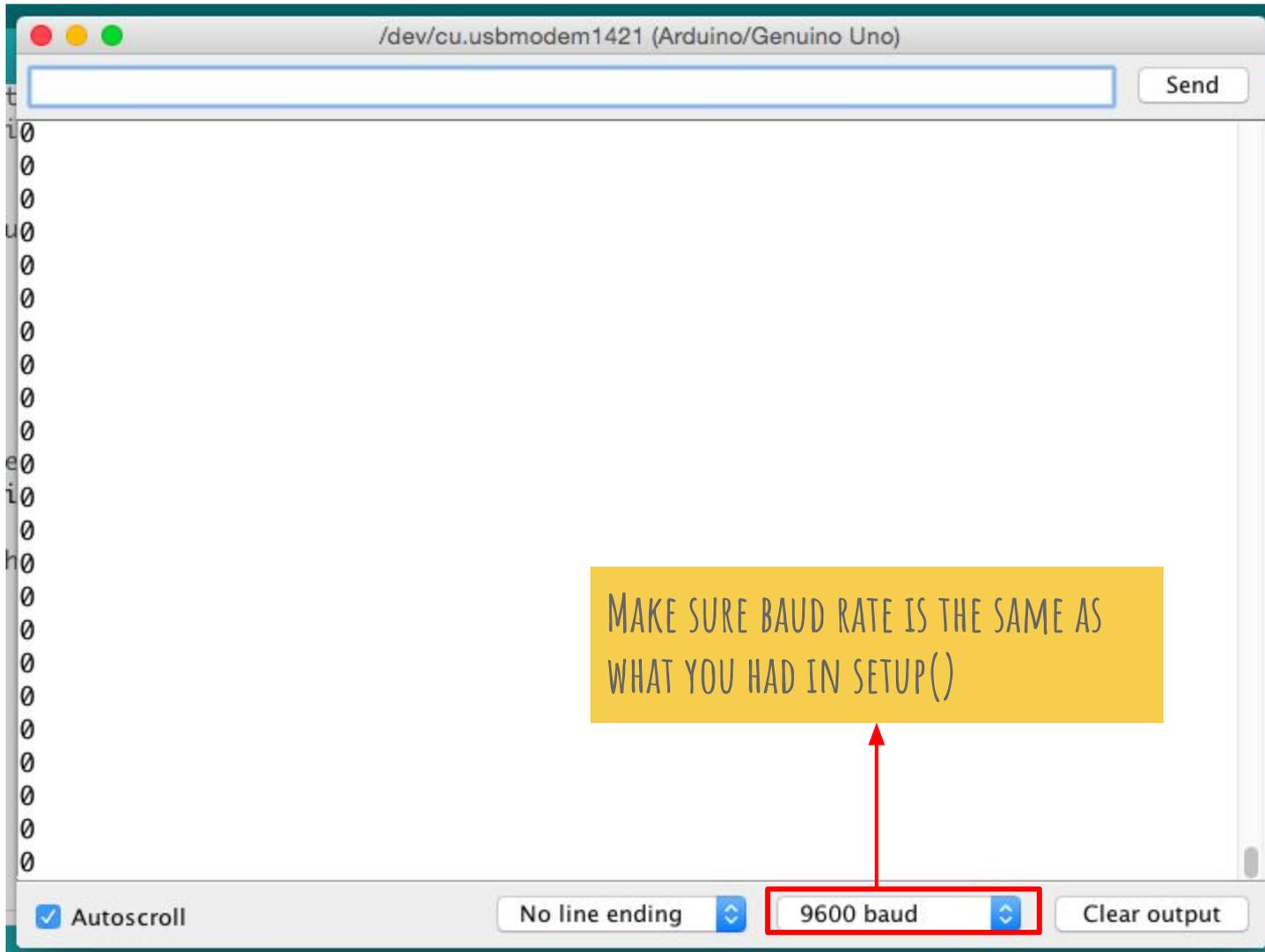
```
const int analogPin = A0;
const int ledPin = 13;
const int threshold = 400;

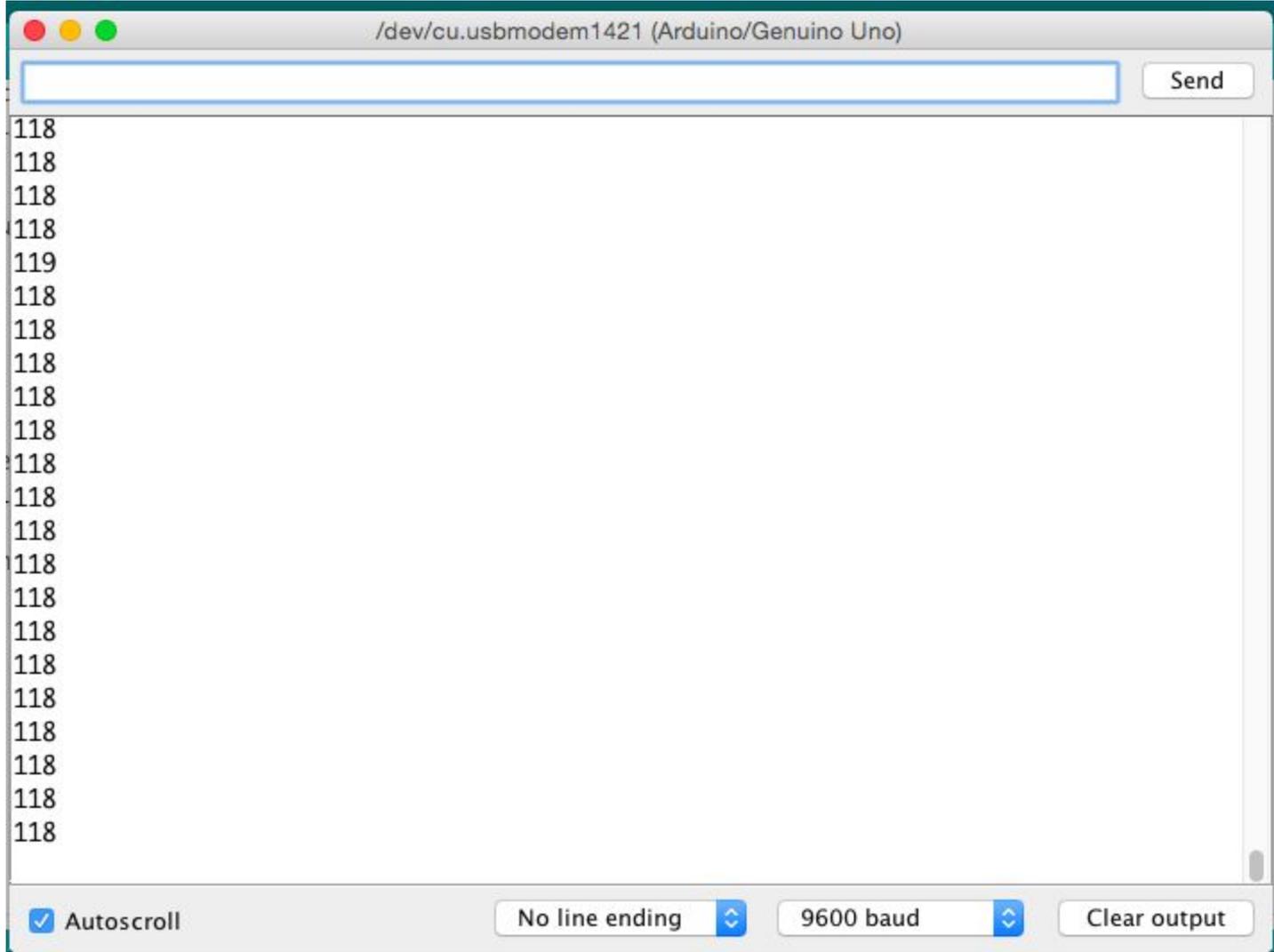
void setup() {
  pinMode(ledPin, OUTPUT);
  Serial.begin(9600);
}

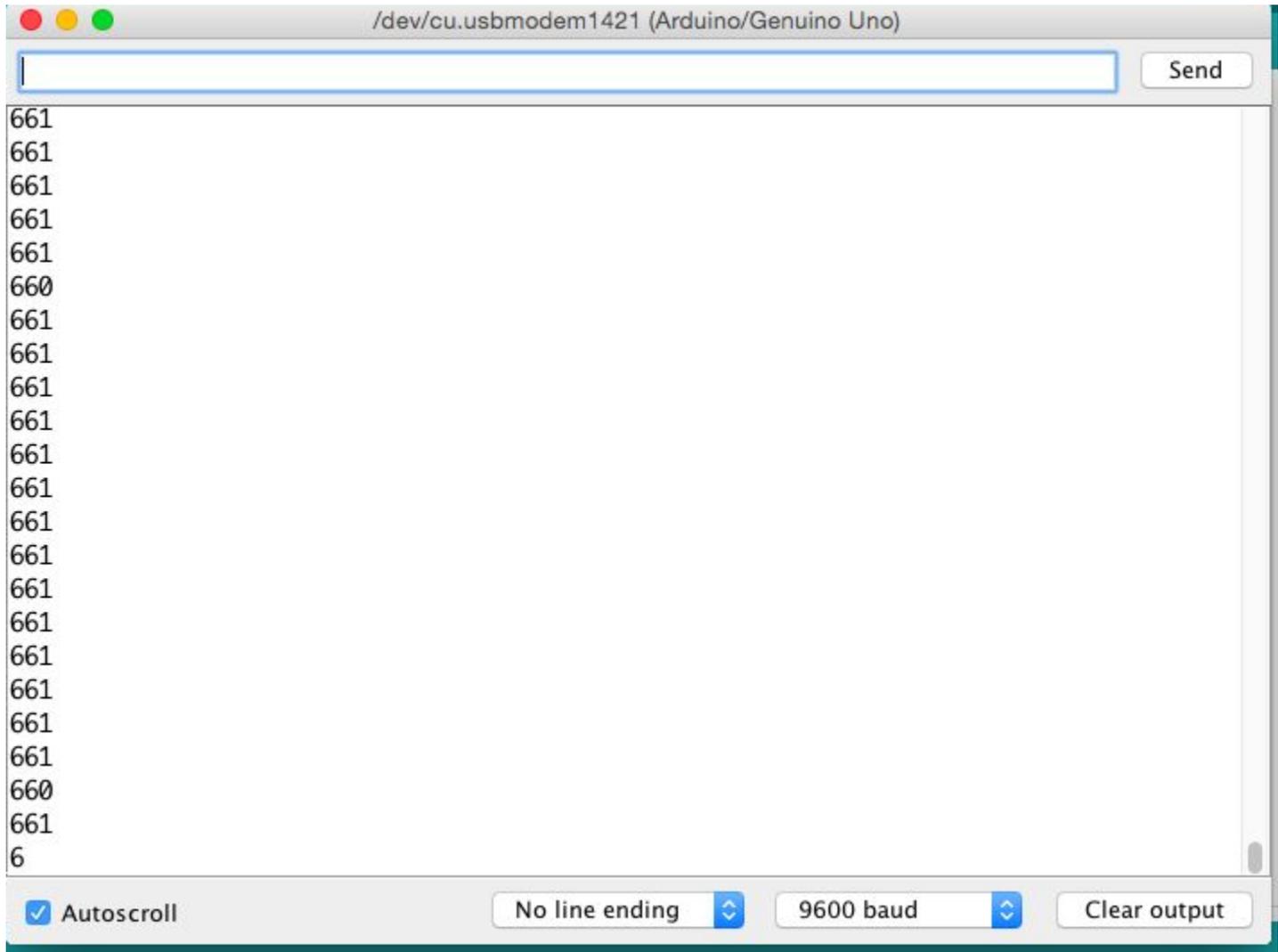
void loop() {
  int analogValue = analogRead(analogPin);

  if (analogValue < threshold) {
    digitalWrite(ledPin, HIGH);
  } else {
    digitalWrite(ledPin, LOW);
  }

  Serial.println(analogValue);
  delay(1);
}
```







ADAFRUIT TUTORIAL ON UNDERSTANDING PHOTOCELL

<https://learn.adafruit.com/photocells/using-a-photocell>

RECAP

1. WE USED `analogRead()` TO
CHECK THE VALUES OF
PHOTOCELL

2. WE USE

```
Serial.println()
```

TO DISPLAY READINGS
FROM YOUR PHOTOCELL

3. WE USE **IF** ... **ELSE**

STATEMENTS FOR

CHECKING BRIGHTNESS