PHOTOBOT

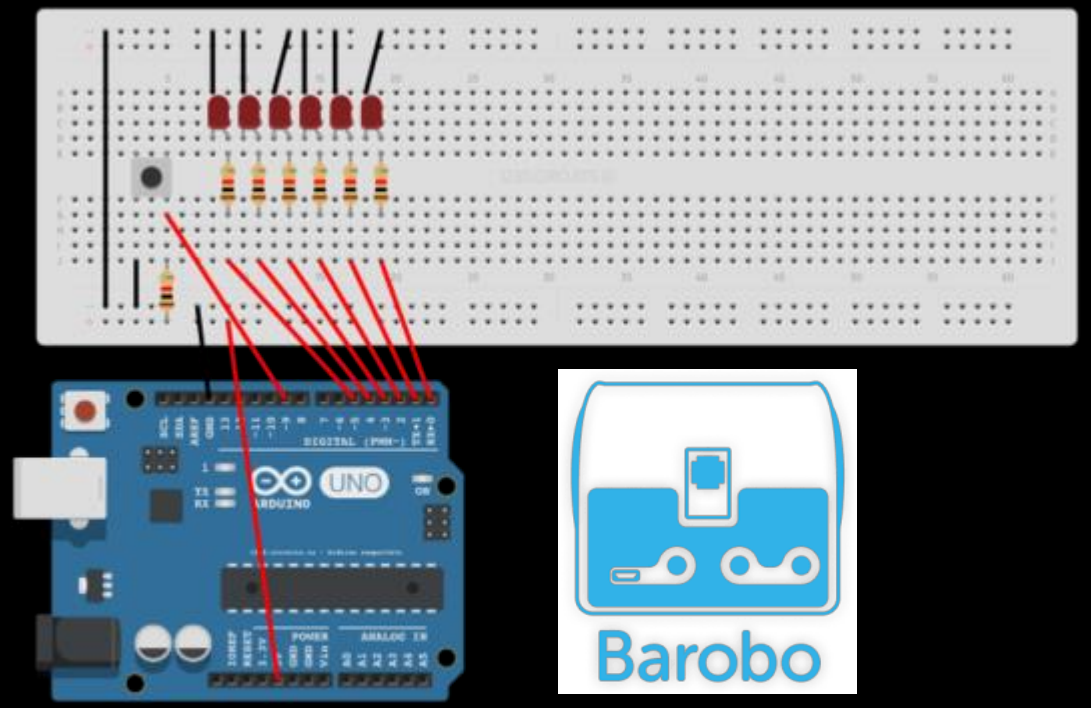
By JETTA

OBJECTIVE

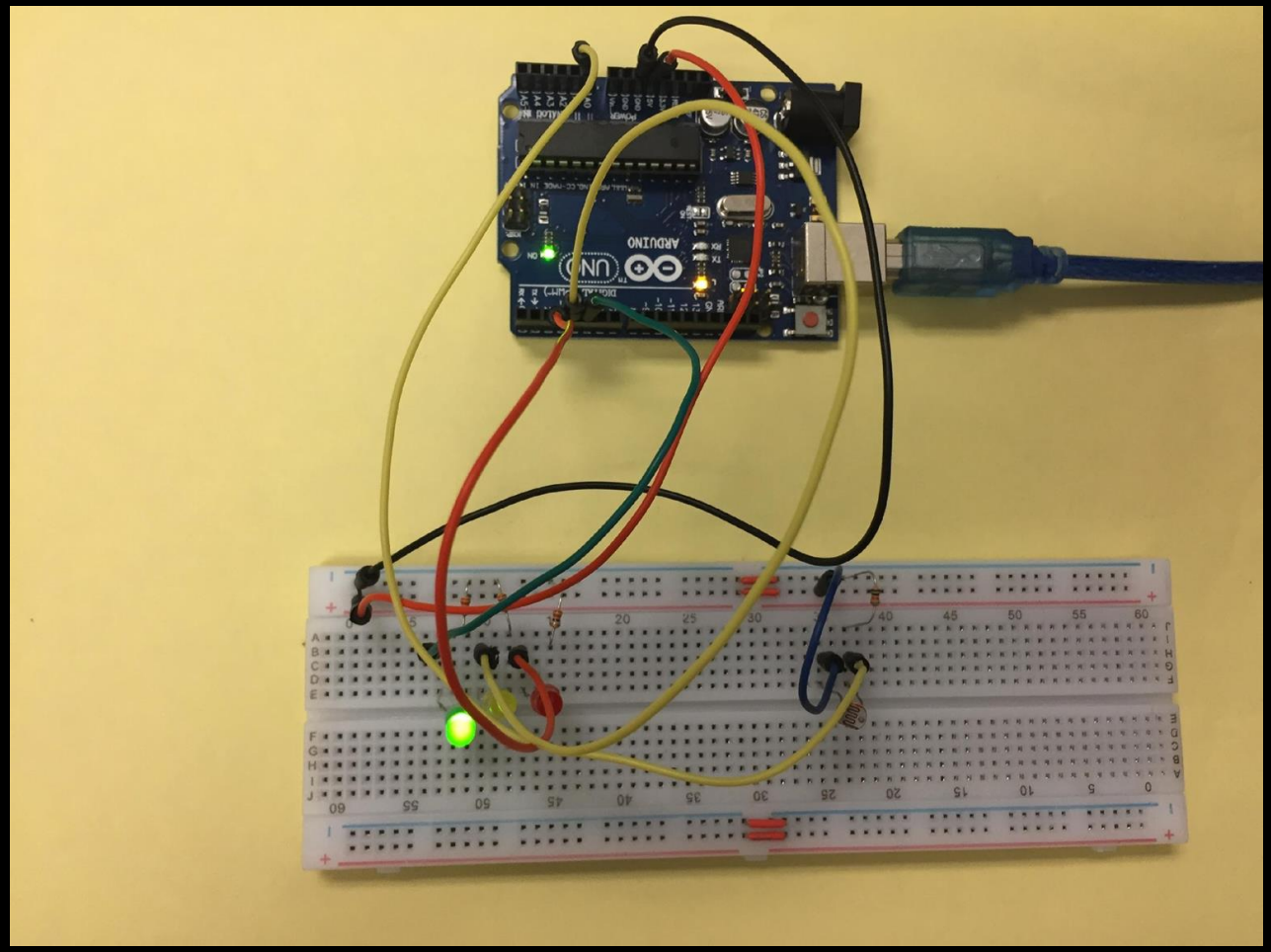
- Utilize a photoresistor, Arduino & Breadboard circuit to move a Linkbot according to LED light colors.

COMPONENTS

- 3 LED Lights: Red, Green, Yellow
- Linkbot
- Photoresistor
- Arduino
- Bread Board
- Wires
- 10k Resistors
- 220 Ω Resistors



BUILDING THE CIRCUIT



CODING PROCESS

```
1  /* file: photobotestj.ch
2   * Create a program that controls a linkbot
3   * based on the values of the photoresistor
4   * LEDs turn red, yellow, or green
5   * depending on the linkbots motion.
6   * Code by Tarang, Jenna, Shea, Elizabeth, Taylor
7   */
8  #include <arduino.h>
9  #include <linkbot.h>
10
11 //declare all variables
12 CLinkbotI robot;
13 double radius = 1.75;
14
15 double speed;
16 int photoSensorVal;
17 int greenLEDpin = 5,
18     redLEDpin = 3,
19     yellowLEDpin = 4,
20     photoPin = A0,
21     photoVal;
22
23 //set pin modes
24 pinMode(redLEDpin, OUTPUT);
25 pinMode(greenLEDpin, OUTPUT);
26 pinMode(yellowLEDpin, OUTPUT);
27 pinMode(photoPin, INPUT);
28
```

Variables(integers and doubles)

Pin modes

CODING PROCESS (CONT.)

```
29    //tell the robot to drive but set the speed to 0 so it doesn't move
30   robot.setSpeed(0, radius);
31   robot.driveForeverNB();
32
```

Setting speed to 0; adjusted later
Non-blocking

CODING PROCESS (CONT.)

```
33  //declaring the printf and speed values and what we wanted it to print
34  //setting the speed of the robot and the LED colors
35  while(1){
36      //getting the value from the photosensor
37      photoSensorVal = analogRead (photoPin);
38
39      //printing and converting the values
40      //photosensor value is made into a double so the speed isn't always 0
41      printf("%d", photoSensorVal);
42
43      speed =((double)photoSensorVal/884)*5;
44      printf(", %.21f\n", speed);
45
46      //force-setting the speed to 0 if it is lower than a certain value
47      if (speed < 1.5) {
48          speed= 0;
49      }
50      //setting the speed to the robot
51      robot.setSpeed(speed, radius);
52
```

While loop

Getting and converting values

Printing Information

Setting Speed

CODING PROCESS (CONT.)

```
52
53      //LED colors in correspondence to speed
54      if(speed == 0){
55          digitalWrite(redLEDpin, HIGH);
56          digitalWrite(greenLEDpin, LOW);
57          digitalWrite(yellowLEDpin, LOW);
58      }
59      else if (speed > 1.5 && speed < 3){
60          digitalWrite(greenLEDpin, LOW);
61          digitalWrite(redLEDpin, LOW);
62          digitalWrite(yellowLEDpin, HIGH);
63      }
64      else{
65          digitalWrite(greenLEDpin, HIGH);
66          digitalWrite(yellowLEDpin, LOW);
67          digitalWrite(redLEDpin, LOW);
68      }
69      //slow process to prevent the arduino from overloading
70      delay(100);
71  }
```

Setting LED colors to speed

Delay for accuracy

FINAL RESULTS AND CONCLUSION

- Linkbot was responsive to photoresistor values

LESSONS LEARNED

- Resistors
- Semicolons
- Integers vs Doubles
- Debugging
- Trial and error

THANK YOU FOR WATCHING!

Any Questions?