LAB REPORT 10

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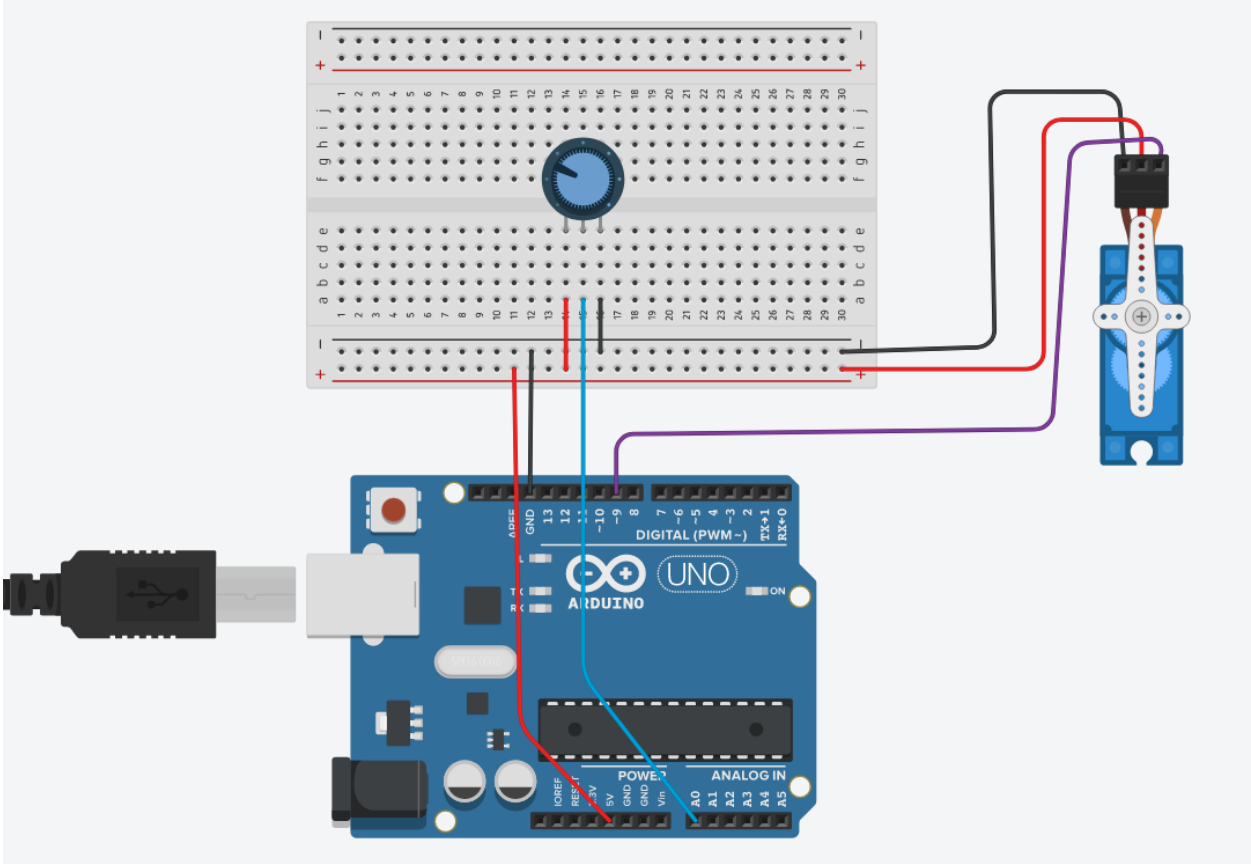
Date: 5/5/21

Screenshot + components:



servo motor: a motor that rotates, which was controlled and analyzed.

potentiometer: a variable resistor, which was used to change the servo motor position and helped find it in degrees.

Summary:

In this lab I set up a circuit that used a servo motor and determined it's positions in degrees with the help of a potentiometer. The first thing I did was just copy the circuit as it was shown in the lab instructions. After that I copied the code and did some experimenting. I soon figured out that turning the potentiometer caused the motor to move and showed it's position in degrees in the serial monitor. At the beginning I didn't really understand how the position was being calculated until I started doing the questions. The map function was the main part of the code that converted the potentiometer reading into degrees. Overall I did not have to do anything else.

Results:

1. With the code y = map(x, 0, 1023, 0, 180);
a. If x is 0 what will y be?
0
b. If x is 512 what will y be?
90
c. If x is 768 what will y be?
135

Serial Monitor:
potpin: 757 133 potpin: 757 133 potpin: 757 133 potpin: 655 115 potpin: 634 111 potpin: 634 111 potpin: 593 104 potpin: 552 97 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 450 79 potpin: 450 79 potpin: 450 79 potpin: 430 75 potpin: 430 75 potpin: 430 75 potpin: 430 75 potpin: 511 89 potpin: 552 97 potpin: 552 97 potpin: 491 86 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 471 82 potpin: 246 43 potpin: 164 28 potpin: 164 28 potpin: 102 17 potpin: 102 17 potpin: 102 17 potpin: 41 7 potpin: 41 7

Conclusions:

1) I learned that a potentiometer is not only helpful in changing resistance, but also in helping to calculate the position of a servo motor.
2) I learned that servo motors are often used in many real world applications like in robots and plumbing.

- I didn't make many mistakes in this lab as it was overall fairly simple. However, I did have some confusion on what the map function was and how it worked at the beginning. However, after experimenting around, I learned that it was used to convert the potpin value into degrees that determined the position of the servo motor.

Code:

```
/* Standard Servomotor sketch
   Bob Wilson
   12/12/2012
   */

#include <Servo.h>

Servo myServo;

int potpin = 0;
int val;

void setup() {
  Serial.begin(9600);
  myServo.attach(9); //we will use pin 9
}

void loop() {
  val = analogRead(potpin);

  /* take the value of val (should be in the
   * range [0, 1023]) and map it to a value
   * in the range [0, 180].
   * 0 -> 0, 1023 -> 180, 511 -> 90 */

  // extra print
  Serial.print("potpin: ");
  Serial.print(val);
  Serial.println();

  val = map(val, 0, 1023, 0, 180);
  Serial.println(val);


  myServo.write(val);
  delay(30);
}
```

Rubric:

Each lab is graded out of 10. Labs are due at midnight a week after they are assigned. Labs turned in late receive a max of 7 points:

Item	Points worth
Code correctness	3
Submission form correct	3
Report contains accurate information	2
Some effort put into report*	2

*No answer is too short to properly address the lab report section and I can tell you tried at least just a little.