DHA SUFFA UNIVERSITY
MEASUREMENT & INSTRUMENTATION LAB
ME-3103L
Lab # 08
Servo Motor

Name: _____   **Reg. #** M E - __ __ __ __ __ __

Class: _____   **Section:** _____   **Max Marks:** 20

INSTRUCTIONS

I. Submit all the lab tasks and post lab tasks printed on A4 paper with **question**, **code**, **picture** and **schematic** of circuit, stapled together with lab manual and filled rubrics.

II. Explain the code by adding **comments**. Marks will be **deducted** for programs without explanation.

III. The due date of submission is exactly **7 days after performing the lab.**

IV. Reports handed **after the deadline** will not be considered.

V. It is always good to mention your name, ID and page # on each page.

OBJECTIVE

To understand the working of servo motor and control it using Potentiometer.

EQUIPMENT

- 1 x Arduino Uno (w/ USB cable)
- 1 x Servo Motor
- 1 x Breadboard
- Jumper Wires
- Potentiometer

COMMANDS

- **Servo Library**
  #include <Servo.h>

- **Declare a Servo Motor**
  Servo *myservo*;

- **Define Servo's Pin #**
  myservo.attach(*pinnumber*);

- **Write Position to Servo Motor**
  myservo.write(*position_in_degrees*);

- **For Loop**
  Syntax:
  for(initialization; condition; increment) {
   // statement(s);
  }

The **initialization** happens first and exactly once. Each time through the loop, the **condition** is tested; if it's true, the statement blocks, and the **increment** is executed, then the condition is tested again. When the condition becomes false, the loop ends.

SCHEMATIC AND WORKING OF THE SENSOR

The Servo Library is a great library for controlling servo motors. It allows Arduino boards to control a variety of servo motors. It makes careful use of timers: the library can control 12 servos using only 1 timer. On the Arduino Due you can control up to 60 servos.

The first example sweeps the shaft of a servo motor back and forth across 180 degrees. The second example controls the position of a servo motor with your potentiometer.

Servo motors have three wires: power, ground, and signal. The power wire is typically red, and should be connected to the 5V pin on the Arduino board. The ground wire is typically black or brown and should be connected to a ground pin on the board. The signal pin is typically yellow or orange and should be connected to PWM pin on the board. In these examples, it is pin number 9.

For the Sweep Example, connect the servo motor to +5V, GND and pin 9.
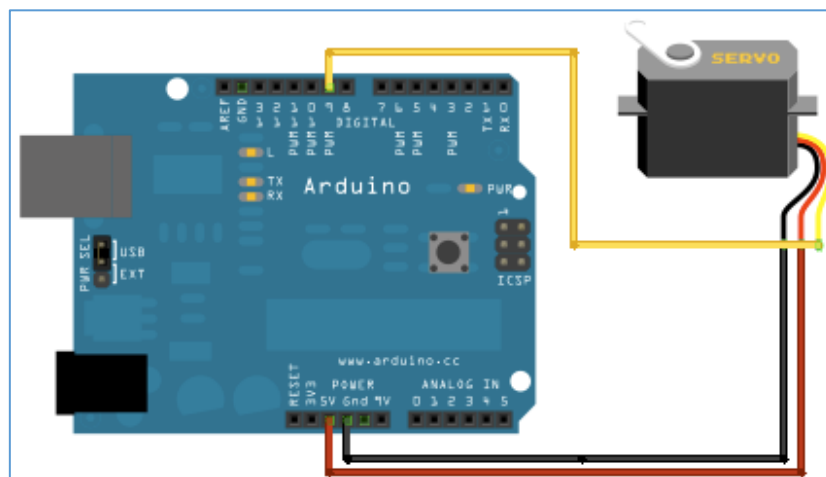
For the Knob Example, wire the potentiometer so that its two outer pins are connected to power (+5V) and ground, and its middle pin is connected to **Analog In** on the board. Then, connect the servo motor to +5V, GND and pin 9 or any PWM pin.
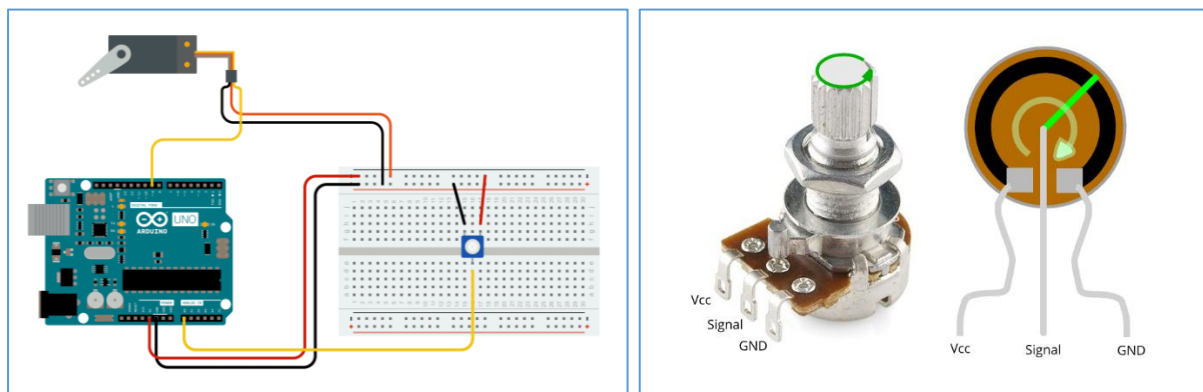
LAB TASKS

Q1) Develop the program which would generate a sweep motion (0°-180° and then 180°-0°) by using a servo motor. Print the values of angle and add it in your report.

Q2) Develop a program that would allow user to control a servo motor with the help of rotary potentiometer. Print both results on serial monitor and them in your report when the potentiometer is at its middle value.

POST LAB TASKS

Q1) Give any 2 examples of practical applications of a 180° servo motor.

Q2) By expanding the application of question # 2, write a code which includes blinking of an LED if the motor has reached its maximum rotation (in other words when the potentiometer output is 1023). Explain your code by comment on each line and draw the circuit diagram.