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Programmable Robotic Arm – Prototype 1

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Project Report

**Time:** 2 days

**Introduction:**

In this project the end goal is to create a robotic arm that can be used to hold breadboards and could record and memorize poses, the ultimate use is to hold breadboards and components for further projects. The only requirements for this prototype are the ability for 3 points of 180-degree articulation and the ability to record the movements so that it can repeat the process repeatedly. In this part of the project the goal was to design a silhouette of the robotic arm by making the basic functions using physical controls, that being, potentiometers and pushbuttons.

**Materials:**

* 3 – potentiometers
* 1 – Arduino Uno R3
* 2 – breadboards
* Jumper wires
* 5 – LED’s
* 2 – MS18 micro servo motors
* 1 – SM-S2309S Servo Motor
* 2 – 20V Electrolytic Capacitors
* 2 – Tactile Pushbuttons
* 2 – 10KΩ resistors
* 5 - 220Ω resistors

**Background:**

This Prototype is made mirroring the project made by Ryan Chan from the Arduino project hub. According to the author this arm is made of recycle parts mainly carboard. The arm functions with three joints of articulation. The only features of this project are the ability to record 5 positions. The schematic will show more within the folder.

From the code used there are three sections. In the initialization section, it starts off by importing the servo library which is needed to define the servo objects. The inputs consist of 3 potentiometers and 2 pushbuttons, the code defines the pins for the potentiometers and pins 12 and pins 13 for the pushbuttons. The code then defines the outputs which are LED’s and the servo motors. The LED’s will inhabit the pins 2, 3, 4, 7, and 8. There are also a defined variable that will holds the mount of button presses and a Boolean type variable that checks if . There are also defined integer variables that will hold potentiometer values and variables that hold angles converted from the potentiometer values. There are 3 arrays that will be used to remember positions and angles.

In the setup method, the servo motor objects are attached to pins 5, 6, and 9 using the attach function . The LED’s and pushbuttons are defined to be outputs and inputs using the serial monitor is then defined at 9600 bauds.

**Observations:**

**Simulation –** for the simulation I used the website Tinker Cad. I could only simulate the servo motors and their movements. Instead of a SM-S2309S Servo Motor I used 3 MS18 micro servo motors.

**Test Bench –** from the test bench I used two breadboards to accommodate for the size. At first, I have only tested the servo motors without the actual structure of the arm. The structure is a rather flimsy because most of the components are in close quarters with each other.

**Results:**

**Conclusion:**