

## Write the Arduino code to control the robot

The image shows the Arduino IDE interface with a sketch titled "sketch\_jul29b". The code is a C++ program for a robotic gripper, likely for a ROS-based system. It includes headers for Arduino, Servo, and JointState, and defines a gripper class with methods for position updates and servo control.

```
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sketch_jul29b $
//if defined(ARDUINO) 44 ARDUINO >= 100
#include "Arduino.h"
#else
#include <Program.h>
#endif

#include <Servo.h>
#include <ros.h>
#include <std_msgs/UInt16.h>
#include <sensor_msgs/JointState.h>

ros::NodeHandle nh;
Servo gripper;
Servo wrist;
Servo elbow;
Servo shoulder;
Servo base;

double base_angle=90;
double shoulder_angle=90;
double elbow_angle=90;
double wrist_angle=90;

double prev_base = 0;
double prev_shoulder = 0;
double prev_elbow = 0;
double prev_wrist = 0;

int gripperState = 0;
int positionChanged = 0;

void servo_cb(const sensor_msgs::JointState& cmd_msg){
  base_angle=radiansToDegrees(cmd_msg.position[0]);
  shoulder_angle=radiansToDegrees(cmd_msg.position[1]);
  elbow_angle=radiansToDegrees(cmd_msg.position[2]);
  wrist_angle=radiansToDegrees(cmd_msg.position[3]);

  base.write(base_angle);
  shoulder.write(shoulder_angle);
  elbow.write(elbow_angle);
  wrist.write(wrist_angle);

  // from base base angle to prev shoulder shoulder angle to prev elbow elbow angle to prev wrist wrist angle to prev
}
```

```
sketch_jul29b | Arduino (Windows Store 1.6.57.0)
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sketch_jul29b $
#include <Servo.h>
#define SERVO_PIN 9 // Servo pin
#define POT_PIN 0 // Potentiometer pin
#define POT_MAX 1023 // Potentiometer max value
#define POT_MIN 0 // Potentiometer min value
#define SERVO_MAX 180 // Servo max angle
#define SERVO_MIN 0 // Servo min angle

Servo servo;

void setup() {
  pinMode(POT_PIN, INPUT);
  servo.attach(SERVO_PIN);
}

void loop() {
  int pot_value = analogRead(POT_PIN);
  int servo_angle = map(pot_value, POT_MIN, POT_MAX, SERVO_MIN, SERVO_MAX);
  servo.write(servo_angle);
  delay(100);
}
```

