Robotic Arm

Module Code: GEEN1064

Module Name: Engineering Design and Implementation

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Braccio

Braccio/Braccia [Brattcho/Brattcha] is the Italian word for arm.



Functions you should NOT use

```
void roboticArmBegin();
void processCommand();
int whichMotor(String l_Command, String l_Motor);
void moveServo(Servo &servo,..., const char *servoName);
void softStart(int soft_start_level);
void softwarePWM(int high_time, int low_time);
```

Moving Motors Indiviually

stepDelay: Delay in milliseconds between each step, controlling the speed of movement, between 10 & 30

```
void -moveBase(int stepDelay, int vBase);
void moveShoulder(int stepDelay, int vShoulder);
void moveElbow(int stepDelay, int vElbow);
void moveWrist_Ver(int stepDelay, int vWrist_ver);
void moveWrist_Rot(int stepDelay, int vWrist_rot);
void moveGripper(int stepDelay, int vgripper);
```

```
moveBase(10, 180); // move base to 180 degrees
```

Move all motors

Note: This code is one line

Robot moves in the following order:

• base -> shoulder -> elbow -> wrist vertical -> wrist rotation -> gripper

Some other useful functions

```
void printPosition() {
  Serial.print("B: ");
  Serial.print(step_base);
  Serial.print(" S: ");
  Serial.print(step_shoulder);
  Serial.print(" E: ");
  Serial.print(step_elbow);
  Serial.print(" V: ");
  Serial.print(step_wrist_ver);
  Serial.print(" R: ");
  Serial.print(step_wrist_rot);
  Serial.print(" G: ");
  Serial.println(step_gripper);
```

Some other useful functions

```
void homePosition() {
       //For each step motor this set up the initial degree
       base.write(90);
       shoulder.write(90);
       elbow.write(180);
       wrist_ver.write(180);
       wrist_rot.write(90);
       gripper.write(10);
       delay(1000);
       //Previous step motor position
       step\_base = 90;
       step_shoulder = 90;
       step elbow = 180;
       step_wrist_ver = 180;
       step_wrist_rot = 90;
       step_gripper = 10;
       Serial.println("In Home position: B90 S90 E180 V180 R90 G10");
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```

Source code

RoboticArm.ino

```
. . .
Serial.println("");
Serial.println("First Movement");
                //(SD, BA, SH, EL, WV, WR, GR);
roboticArmMovement(20, 180, 30, 10, 60, 90, 73);
//Wait 2 second recommended for power to discharge from the servos
delay(2000);
Serial.println("");
Serial.println("Second Movement");
Serial.println("");
                //(SD, BA, SH, EL, WV, WR, GR);
roboticArmMovement(20, 0, 120, 10, 100, 10, 10);
// Wait 2 second recommended for power to discharge from the servos
```

Source code

Robot_Arm_Manual_Instructions_via_serial.ino

```
/*Code here one once during startup*/
void setup() {
    initialiseRoboticArm(); // Must be called before using braccio!
}

/*Code here runs forever!*/
void loop() {

    // waits for your commands via the serial monitor and then executes them serialListener();
}
```