Humanoid Bipedal Locomotion Prototype - Arduino Code

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Description: Arduino-based servo control for a 3-DOF humanoid leg.

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// Humanoid Bipedal Locomotion Control
// Author: Kanhaiya Deshmukh
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// Description: Controls a 3-DOF leg using servo motors for hip, knee, and ankle joints.
// Commands sent via Serial Monitor to change positions (Standing, Sitting, Home).

#include <Servo.h>

Servo servoHip;    // Hip Joint
Servo servoKnee;   // Knee Joint
Servo servoAnkle;  // Ankle Joint

void setup() {
  Serial.begin(9600);
  Serial.println("Humanoid Bipedal Locomotion Control Initialized");

  // Assign pins to servos
  servoHip.attach(7);
  servoKnee.attach(8);
  servoAnkle.attach(9);

  // Set to Home position at start
  homePosition();
}

void loop() {
  if (Serial.available() > 0) {
    int command = Serial.parseInt();
    Serial.print("Command received: ");
    Serial.println(command);

    switch (command) {
      case 1:
        standingPosition();
        break;
      case 2:
        sittingPosition();
        break;
      default:
        homePosition();
        break;
    }
  }
}

// ----- POSITION FUNCTIONS -----

void homePosition() {
  servoHip.write(60);
  servoKnee.write(60);
  servoAnkle.write(60);
  Serial.println("Home Position");
}

void standingPosition() {
  servoHip.write(30);
  servoKnee.write(30);
  servoAnkle.write(30);
  Serial.println("Standing Position");
}
```