```
#include <Servo.h>
//variable that receives the command from the python code
int incomingMessage=0;
//Sets the left side home position
int leftHomePosition=115;
//Keeps track of the horizontal angle
int horizontalAngleTrack=leftHomePosition;
int downHomePosition=90;
//Keeps track of the vertical angle
int verticalAngleTrack=downHomePosition;
//Sets the increment of the horizontal angle every time the
//move command is called
int horizontalIncrement=1;
//Sets the increment of the vertical angle every time the move
//command is called
int verticalIncrement=1;
//Declares a servo called horizontal_servo
Servo horizontal Servo;
//Declares a servo called vertical_servo
Servo verticalServo;
void setup()
   //Sets up the sensor in the analog pin A5
 pinMode(A5, INPUT);
  //Initializes the serial port
  Serial.begin(9600);
  //Declares the pin that the servo controlling horizontal
  //angle is connected to
 horizontalServo.attach(7);
 //Declares the pin that the servo controlling vertical
  //angle is connected to
 verticalServo.attach(8);
}
// the loop routine runs over and over again forever:
void loop() {
  //Sends data only when it is received
  if (Serial.available()>0){
    //Waits for a message from the serial port (in this case,
    // from python code)
   incomingMessage=Serial.read();
    //Moves to the right
```

```
if (incomingMessage=='1'){
  //Decrements the horizontal angle by the specified
  //increment to
  //move it to the right
 horizontalAngleTrack=horizontalAngleTrack-horizontalIncrement;
  //writes the new angle to the servo to move it there
 horizontalServo.write(horizontalAngleTrack);
//Moves to the left
if (incomingMessage=='2'){
 //Increases the horizontal angle by the specified
  //increment to move
  //it to the left
horizontalAngleTrack=horizontalAngleTrack+horizontalIncrement;
//writes the new angle to the servo to move it there
 horizontalServo.write(horizontalAngleTrack);
//Moves the servo up
if (incomingMessage=='3'){
 //Increases the vertical angle by the specified
  //increment to move it up
verticalAngleTrack=verticalAngleTrack+verticalIncrement;
//Writes that angle to the servo to move it there
 verticalServo.write(verticalAngleTrack);
}
//Moves the servo down
if (incomingMessage=='4'){
  //Decreases the vertical angle by the specified increment
 //to move it down
 verticalAngleTrack=verticalAngleTrack-verticalIncrement;
 //Writes that angle to the servo to move it there
 verticalServo.write(verticalAngleTrack);
}
//Moves sensor all the way left
if (incomingMessage=='5'){
  //Sets the horizontal angle to the left_home_position
horizontalAngleTrack=leftHomePosition;
//writes that angle to the servo to move it there
 horizontalServo.write(horizontalAngleTrack);
}
//Moves sensor to the lowest possible vertical angle setting
```

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if (incomingMessage=='6'){
  //Sets the vertical angle to the down_home_position
 verticalAngleTrack=downHomePosition;
  //Writes that angle to the servo to move it there
 verticalServo.write(verticalAngleTrack);
}
//Takes a reading from the sensor
if (incomingMessage=='7'){
  //Takes a reading from the sensor connected to port A5
  int reading =analogRead(A5);
  //Uses the model we derived to calculate distance from
  //the sensor reading obtained
 float distance=25732.834527*pow(reading,-1.1314581);
  //Prints that distance to the serial port for the python
  //code to receive
 Serial.println(distance);
}
//Sends back the current horizontal and vertical angles
if (incomingMessage=='8'){
  //Packs the current vertical and horizontal angle into a
  //concatenated string to print to serial port
  String anglePacked=String(verticalAngleTrack)+','+String(horizontalAngleTrack)
  Serial.println(anglePacked);//Prints that concatenated
  //string to the serial port for python to receive
}
```