#include <Servo.h>

Servo myservoA;

Servo myservoB;

Servo myservoC;

Servo myservoD;

Servo myservoE;

Servo myservoF;

int i,pos,myspeed,myshow;

int sea,seb,sec,sed,see,sef;

static int v=0;

String mycommand=""; //Receive commands from serial ports #auto：auto run #com：computer serial control #stop：stop status

static int mycomflag=2; // #auto：2 , #com： 1 #stop：0

void myservosetup() //Initialize the servo motors

{

sea=myservoA.read();

seb=myservoB.read();

sec=myservoC.read();

sed=myservoD.read();

see=myservoE.read();

sef=myservoF.read();

myspeed=500;

for(pos=0;pos<=myspeed;pos+=1)

{

myservoA.write(int(map(pos,1,myspeed,sea,66)));

myservoB.write(int(map(pos,1,myspeed,seb,90)));

myservoC.write(int(map(pos,1,myspeed,sec,50)));

myservoD.write(int(map(pos,1,myspeed,sed,90)));

myservoE.write(int(map(pos,1,myspeed,see,120)));

myservoF.write(int(map(pos,1,myspeed,sef,90)));

delay(1);

}

}

void setup()

{

pinMode(13,INPUT); // Configures the specified pin to behave either as an input or an output.

pinMode(12,INPUT);

Serial.begin(9600); // opens serial port, sets data rate to 9600 bps

Serial.println("Hello!");

myshow=0;

mycomflag=2; // Robot arm default status: 2 auto

myservoA.attach(3); // Waist Joint (A): Port 3

myservoB.attach(5); // Upper Arm Joint (B): Port 5

myservoC.attach(6); // Forearm Joint (C): Port 6

myservoD.attach(9); // Rotation of Forearm Joint (D): Port 9

myservoE.attach(10); // Wrist Joint (E): Port 10

myservoF.attach(11); // Rotation of Wrist Joint (F): Port 11

myservoA.write(66);

myservoB.write(90);

myservoC.write(50);

myservoD.write(90);

myservoE.write(120);

myservoF.write(90);

}

void loop()

{

while (Serial.available()>0)

{

mycommand += char(Serial.read());

delay(2);

}

if (mycommand.length() > 0)

{

if(mycommand=="#auto")

{

mycomflag=2;

Serial.println("auto station");

mycommand="";

}

if(mycommand=="#com")

{

mycomflag=1;

Serial.println("computer control station");

mycommand="";

myservosetup();

}

if(mycommand=="#stop")

{

mycomflag=0;

Serial.println("stop station");

mycommand="";

}

}

if(mycomflag==1) //if com 1

{

for(int m=0;m<mycommand.length();m++)

{

char ch = mycommand[m]; // Receive command from serial ports

switch(ch)

{

case '0'...'9':

v = v\*10 + ch - '0'; // Convert characters to decimal

break;

case 'a': //if data received is 85a ---> motor A

if(v >= 5 || v <= 175 ) myservoA.write(v); // Set the angle command to servo motor A from 0~180 degree (85a means 85 degree)

v = 0;

break;

case 'b': //if data received is 90b ---> motor B

myservoB.write(v); //Set the angle command to servo motor B from 0~180 degree (90b means 90 degree)

v = 0;

break;

case 'c':

if(v >= 20 ) myservoC.write(v);

v = 0;

break;

case 'd':

myservoD.write(v);

v = 0;

break;

case 'e':

myservoE.write(v);

v = 0;

break;

case 'f':

myservoF.write(v);

v = 0;

break;

}

}

mycommand="";

} // end if(mycomflag=1)

if(mycomflag==2) //if auto 2

{

delay(3000);

//Serial.println("auto station");

myservosetup();

myspeed=500;

for(pos = 0; pos <=myspeed; pos += 1)

{

myservoA.write(int(map(pos,1,myspeed,66,90))); // turn A from 66 to 90 degrees

myservoB.write(int(map(pos,1,myspeed,90,40))); // turn B from 90 to 40 degrees

delay(1);

}

delay(1000);

myspeed=500;

for(pos = 0; pos <=myspeed; pos += 1)

{

myservoC.write(int(map(pos,1,myspeed,50,65)));

myservoD.write(int(map(pos,1,myspeed,90,170)));

myservoE.write(int(map(pos,1,myspeed,90,5)));

delay(1);

}

myspeed=1000;

for(pos = 0; pos <=myspeed; pos += 1)

{

myservoB.write(int(map(pos,1,myspeed,40,70)));

myservoC.write(int(map(pos,1,myspeed,65,50)));

delay(1);

}

myspeed=500;

for(pos = 0; pos <=myspeed; pos += 1)

{

myservoC.write(int(map(pos,1,myspeed,50,45)));

myservoD.write(int(map(pos,1,myspeed,170,90)));

myservoE.write(int(map(pos,1,myspeed,5,27)));

myservoF.write(int(map(pos,1,myspeed,90,40)));

delay(1);

}

myspeed=1000;

for(pos = 0; pos <=myspeed; pos += 1)

{

myservoA.write(int(map(pos,1,myspeed,90,140)));

myservoF.write(int(map(pos,1,myspeed,40,130)));

delay(1);

}

myspeed=500;

for(pos = 0; pos <=myspeed; pos += 1)

{

myservoA.write(int(map(pos,1,myspeed,140,90)));

myservoC.write(int(map(pos,1,myspeed,45,50)));

myservoB.write(int(map(pos,1,myspeed,70,50)));

myservoE.write(int(map(pos,1,myspeed,27,120)));

delay(1);

}

}

if(mycomflag==0) //if stop 0

{

myservosetup();

}

}