```cpp
1   #include "mbed.h"
2   #include <math.h>
3   #include "C12832.h"
4   #define pi 3.14159265358979323846264338327950288419716939937510582
5   #define amplitude 1000
6   C12832 lcd(p5, p7, p6, p8, p11);
7   Serial snake(p9, NC);
8   Serial pc(USBTX, USBRX);
9   DigitalOut myled1(LED1);
10  DigitalOut myled2(LED2);
11  int i, y, m, n, counter=0;      //m=motor id
12  float a, b, c, d, t, j;
13  unsigned short int motorInt[]={7600,7500,7000,7500,7400,7000,7200,7500,7300};
14  unsigned short int motorAngle[]={7600,7500,7000,7500,7400,7000,7200,7500,7300};
15  unsigned short int motorID[]={0,1,2,3,4,5,6,7,8};
16  unsigned short int motorPositions[]={7600,7500,7000,7500,7400,7000,7200,7500,7300};
17  unsigned short int shapeFactor[]={1,1.7,1.6,1.5,1.4,1.3,1.2,1.1,1};
18  Timer timer;
19
20  void motor_update(unsigned char Id, unsigned short int Position)
21  {
22      unsigned short int id,lo,hi;
23      snake.format(8, Serial::Even, 1); // setup for kondo motor
24      snake.baud(115200);
25      id=0x80|Id;
26      hi=(Position>>7)&0x007F;
27      lo=Position&0x007F;
28      snake.putc(id);
29      snake.putc(hi);
30      snake.putc(lo);
31      wait(0.001);
32  }
33
34  void position_update(void)
35  {
36      unsigned char motor;
37      for(motor=0;motor<sizeof(motorPositions);motor++)
38      {
39          motor_update(motorID[motor], motorPositions[motor]);
40      }
41  }
42
43  void SubStep(void)
44  {
45      for(j=7500.00;j<motorAngle[m];j+=1)
46      {
47          motorAngle[m] = ((motorAngle[m]-motorInt[m])/10)+motorInt[m];
48          motorPositions[m] = motorAngle[m];
49          position_update();
50      }
51  }
52
53  int main()
54  {
55      myled1 = 0;
56      for(i=1;i<2;i+=1)
57      {
58          for (t=0;t<2;t+=0.025)
59          {
60              for (m=0;m<9;m+=1)
61              {
62                  timer.start();
```

```cpp
63                    y = m-1;
64                    a = 1*pi; //a = angular frequency, b = phase shift
65                    b = 2*pi/8;
66                    c = a*t;
67                    d = y*b;
68                    motorAngle[m] = shapeFactor[m]*7500+(amplitude*sin(c+d));
69                    SubStep();
70                    //motorPositions[m] = motorAngle[m];
71                    //position_update();   //~25ms
72                    counter++;
73                    myled1 = !myled1;
74                }
75            myled2 = !myled2;
76            timer.read();
77            lcd.cls();
78            lcd.locate(0,3);
79            lcd.printf("time = %.4f sec.\ncount = %d",timer.read(),counter);
80        }
81    }
82 }
```

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