int layer[4]={A3,A2,A1,A0}; //initializing and declaring led layers

int column[16]={13,12,11,10,9,8,7,6,5,4,3,2,1,0,A5,A4}; //initializing and declaring led rows

int time =250;

void setup()

{

for(int i = 0; i<16; i++)

{

pinMode(column[i], OUTPUT); //setting rows to ouput

}

for(int i = 0; i<4; i++)

{

pinMode(layer[i], OUTPUT); //setting layers to output

}

randomSeed(analogRead(10)); //seeding random for random pattern

}

void loop()

{

turnEverythingOff();

flickerOn();

turnEverythingOn();

delay(time);

turnOnAndOffAllByLayerUpAndDownNotTimed();

layerstompUpAndDown();

spiralInAndOut();

turnOnAndOffAllByColumnSideways();

delay(time);

aroundEdgeDown();

turnEverythingOff();

randomflicker();

randomRain();

diagonalRectangle();

goThroughAllLedsOneAtATime();

propeller();

spiralInAndOut();

flickerOff();

turnEverythingOff();

delay(200);

}

//turn all off

void turnEverythingOff()

{

for(int i = 0; i<16; i++)

{

digitalWrite(column[i], 0);

}

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 0);

}

}

//turn all on

void turnEverythingOn()

{

for(int i = 0; i<16; i++)

{

digitalWrite(column[i], 1);

}

//turning on layers

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 0);

}

}

//turn columns off

void turnColumnsOff()

{

for(int i = 0; i<16; i++)

{

digitalWrite(column[i], 0);

}

}

//flicker on

void flickerOn()

{

int i = 150;

while(i != 0)

{

turnEverythingOn();

delay(i);

turnEverythingOff();

delay(i);

i-= 5;

}

}

//turn everything on and off by layer up and down NOT TIMED

void turnOnAndOffAllByLayerUpAndDownNotTimed()

{

int x = 75;

for(int i = 5; i != 0; i--)

{

turnEverythingOn();

for(int i = 4; i!=0; i--)

{

digitalWrite(layer[i-1], 1);

}

delay(x);

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 0);

}

delay(x);

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 1);

}

delay(x);

for(int i = 4; i!=0; i--)

{

digitalWrite(layer[i-1], 0);

}

delay(x);

delay(100);

}

}

//turn everything on and off by column sideways

void turnOnAndOffAllByColumnSideways()

{

int x = 75;

turnEverythingOff();

//turn on layers

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 0);

}

for(int y = 0; y<3; y++)

{

//turn on 0-3

for(int i = 0; i<4; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn on 4-7

for(int i = 4; i<8; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn on 8-11

for(int i = 8; i<12; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn on 12-15

for(int i = 12; i<16; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn off 0-3

for(int i = 0; i<4; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

//turn off 4-7

for(int i = 4; i<8; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

//turn off 8-11

for(int i = 8; i<12; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

//turn off 12-15

for(int i = 12; i<16; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

//turn on 12-15

for(int i = 12; i<16; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn on 8-11

for(int i = 8; i<12; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn on 4-7

for(int i = 4; i<8; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn on 0-3

for(int i = 0; i<4; i++)

{

digitalWrite(column[i], 1);

delay(x);

}

//turn off 12-15

for(int i = 12; i<16; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

//turn off 8-11

for(int i = 8; i<12; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

//turn off 4-7

for(int i = 4; i<8; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

//turn off 0-3

for(int i = 0; i<4; i++)

{

digitalWrite(column[i], 0);

delay(x);

}

}

}

//up and down single layer stomp

void layerstompUpAndDown()

{

int x = 75;

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 0);

}

for(int y = 0; y<5; y++)

{

for(int count = 0; count<1; count++)

{

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 1);

delay(x);

digitalWrite(layer[i], 0);

}

for(int i = 4; i !=0; i--)

{

digitalWrite(layer[i-1], 1);

delay(x);

digitalWrite(layer[i-1], 0);

}

}

for(int i = 0; i<4; i++)

{

digitalWrite(layer[i], 1);

delay(x);

}

for(int i = 4; i!=0; i--)

{

digitalWrite(layer[i-1], 0);

delay(x);

}

}

}

//flicker off

void flickerOff()

{

turnEverythingOn();

for(int i = 0; i!= 150; i+=5)

{

turnEverythingOff();

delay(i+50);

turnEverythingOn();

delay(i);

}

}

//around edge of the cube down

void aroundEdgeDown()

{

for(int x = 200; x != 0; x -=50)

{

turnEverythingOff();

for(int i = 4; i != 0; i--)

{

digitalWrite(layer[i-1], 0);

digitalWrite(column[5], 0);

digitalWrite(column[6], 0);

digitalWrite(column[9], 0);

digitalWrite(column[10], 0);

digitalWrite(column[0], 0);

delay(x);

digitalWrite(column[0], 1);

digitalWrite(column[4], 0);

delay(x);

digitalWrite(column[4], 1);

digitalWrite(column[8], 0);

delay(x);

digitalWrite(column[8], 1);

digitalWrite(column[12], 0);

delay(x);

digitalWrite(column[12], 1);

digitalWrite(column[13], 0);

delay(x);

digitalWrite(column[13], 1);

digitalWrite(column[15], 0);

delay(x);

digitalWrite(column[15], 1);

digitalWrite(column[14], 0);

delay(x);

digitalWrite(column[14], 1);

digitalWrite(column[11], 0);

delay(x);

digitalWrite(column[11], 1);

digitalWrite(column[7], 0);

delay(x);

digitalWrite(column[7], 1);

digitalWrite(column[3], 0);

delay(x);

digitalWrite(column[3], 1);

digitalWrite(column[2], 0);

delay(x);

digitalWrite(column[2], 1);

digitalWrite(column[1], 0);

delay(x);

digitalWrite(column[1], 1);

}

}

}

//random flicker

void randomflicker()

{

turnEverythingOff();

int x = 10;

for(int i = 0; i !=750; i+=2)

{

int randomLayer = random(0,4);

int randomColumn = random(0,16);

digitalWrite(layer[randomLayer], 1);

digitalWrite(column[randomColumn], 0);

delay(x);

digitalWrite(layer[randomLayer], 0);

digitalWrite(column[randomColumn], 1);

delay(x);

}

}

//random rain

void randomRain()

{

turnEverythingOff();

int x = 100;

for(int i = 0; i!=60; i+=2)

{

int randomColumn = random(0,16);

digitalWrite(column[randomColumn], 0);

digitalWrite(layer[0], 1);

delay(x+50);

digitalWrite(layer[0], 0);

digitalWrite(layer[1], 1);

delay(x);

digitalWrite(layer[1], 0);

digitalWrite(layer[2], 1);

delay(x);

digitalWrite(layer[2], 0);

digitalWrite(layer[3], 1);

delay(x+50);

digitalWrite(layer[3], 0);

digitalWrite(column[randomColumn], 1);

}

}

//diagonal rectangle

void diagonalRectangle()

{

int x = 350;

turnEverythingOff();

for(int count = 0; count<5; count++)

{

//top left

for(int i = 0; i<8; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[3], 0);

digitalWrite(layer[2], 0);

delay(x);

turnEverythingOff();

//middle middle

for(int i = 4; i<12; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[1], 0);

digitalWrite(layer[2], 0);

delay(x);

turnEverythingOff();

//bottom right

for(int i = 8; i<16; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[0], 0);

digitalWrite(layer[1], 0);

delay(x);

turnEverythingOff();

//bottom middle

for(int i = 4; i<12; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[0], 0);

digitalWrite(layer[1], 0);

delay(x);

turnEverythingOff();

//bottom left

for(int i = 0; i<8; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[0], 0);

digitalWrite(layer[1], 0);

delay(x);

turnEverythingOff();

//middle middle

for(int i = 4; i<12; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[1], 0);

digitalWrite(layer[2], 0);

delay(x);

turnEverythingOff();

//top right

for(int i = 8; i<16; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[2], 0);

digitalWrite(layer[3], 0);

delay(x);

turnEverythingOff();

//top middle

for(int i = 4; i<12; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[2], 0);

digitalWrite(layer[3], 0);

delay(x);

turnEverythingOff();

}

//top left

for(int i = 0; i<8; i++)

{

digitalWrite(column[i], 1);

}

digitalWrite(layer[3], 0);

digitalWrite(layer[2], 0);

delay(x);

turnEverythingOff();

}

//propeller

void propeller()

{

turnEverythingOff();

int x = 90;

for(int k=0;k<4;k++)

{

digitalWrite(layer[k],0);

}

for(int y = 4; y>0; y--)

{

for(int i = 0; i<6; i++)

{

//a1

turnColumnsOff();

digitalWrite(column[0], 1);

digitalWrite(column[5], 1);

digitalWrite(column[10], 1);

digitalWrite(column[15], 1);

delay(x);

//b1

turnColumnsOff();

digitalWrite(column[4], 1);

digitalWrite(column[5], 1);

digitalWrite(column[10], 1);

digitalWrite(column[11], 1);

delay(x);

//c1

turnColumnsOff();

digitalWrite(column[6], 1);

digitalWrite(column[7], 1);

digitalWrite(column[8], 1);

digitalWrite(column[9], 1);

delay(x);

//d1

turnColumnsOff();

digitalWrite(column[3], 1);

digitalWrite(column[6], 1);

digitalWrite(column[9], 1);

digitalWrite(column[12], 1);

delay(x);

//d2

turnColumnsOff();

digitalWrite(column[2], 1);

digitalWrite(column[6], 1);

digitalWrite(column[9], 1);

digitalWrite(column[13], 1);

delay(x);

//d3

turnColumnsOff();

digitalWrite(column[1], 1);

digitalWrite(column[5], 1);

digitalWrite(column[10], 1);

digitalWrite(column[14], 1);

delay(x);

}

}

//d4

turnColumnsOff();

digitalWrite(column[0], 1);

digitalWrite(column[5], 1);

digitalWrite(column[10], 1);

digitalWrite(column[15], 1);

delay(x);

}

//spiral in and out

void spiralInAndOut()

{

turnEverythingOn();

int x = 60;

for(int i = 0; i<6; i++)

{

//spiral in clockwise

digitalWrite(column[0], 1);

delay(x);

digitalWrite(column[1], 1);

delay(x);

digitalWrite(column[2], 1);

delay(x);

digitalWrite(column[3], 1);

delay(x);

digitalWrite(column[7], 1);

delay(x);

digitalWrite(column[11], 1);

delay(x);

digitalWrite(column[15], 1);

delay(x);

digitalWrite(column[14], 1);

delay(x);

digitalWrite(column[13], 1);

delay(x);

digitalWrite(column[12], 1);

delay(x);

digitalWrite(column[8], 1);

delay(x);

digitalWrite(column[4], 1);

delay(x);

digitalWrite(column[5], 1);

delay(x);

digitalWrite(column[6], 1);

delay(x);

digitalWrite(column[10], 1);

delay(x);

digitalWrite(column[9], 1);

delay(x);

//spiral out counter clockwise

digitalWrite(column[9], 0);

delay(x);

digitalWrite(column[10], 0);

delay(x);

digitalWrite(column[6], 0);

delay(x);

digitalWrite(column[5], 0);

delay(x);

digitalWrite(column[4], 0);

delay(x);

digitalWrite(column[8], 0);

delay(x);

digitalWrite(column[12], 0);

delay(x);

digitalWrite(column[13], 0);

delay(x);

digitalWrite(column[14], 0);

delay(x);

digitalWrite(column[15], 0);

delay(x);

digitalWrite(column[11], 0);

delay(x);

digitalWrite(column[7], 0);

delay(x);

digitalWrite(column[3], 0);

delay(x);

digitalWrite(column[2], 0);

delay(x);

digitalWrite(column[1], 0);

delay(x);

digitalWrite(column[0], 0);

delay(x);

//spiral in counter clock wise

digitalWrite(column[0], 1);

delay(x);

digitalWrite(column[4], 1);

delay(x);

digitalWrite(column[8], 1);

delay(x);

digitalWrite(column[12], 1);

delay(x);

digitalWrite(column[13], 1);

delay(x);

digitalWrite(column[14], 1);

delay(x);

digitalWrite(column[15], 1);

delay(x);

digitalWrite(column[11], 1);

delay(x);

digitalWrite(column[7], 1);

delay(x);

digitalWrite(column[3], 1);

delay(x);

digitalWrite(column[2], 1);

delay(x);

digitalWrite(column[1], 1);

delay(x);

digitalWrite(column[5], 1);

delay(x);

digitalWrite(column[9], 1);

delay(x);

digitalWrite(column[10], 1);

delay(x);

digitalWrite(column[6], 1);

delay(x);

//spiral out clock wise

digitalWrite(column[6], 0);

delay(x);

digitalWrite(column[10], 0);

delay(x);

digitalWrite(column[9], 0);

delay(x);

digitalWrite(column[5], 0);

delay(x);

digitalWrite(column[1], 0);

delay(x);

digitalWrite(column[2], 0);

delay(x);

digitalWrite(column[3], 0);

delay(x);

digitalWrite(column[7], 0);

delay(x);

digitalWrite(column[11], 0);

delay(x);

digitalWrite(column[15], 0);

delay(x);

digitalWrite(column[14], 0);

delay(x);

digitalWrite(column[13], 0);

delay(x);

digitalWrite(column[12], 0);

delay(x);

digitalWrite(column[8], 0);

delay(x);

digitalWrite(column[4], 0);

delay(x);

digitalWrite(column[0], 0);

delay(x);

}

}

//go through all leds one at a time

void goThroughAllLedsOneAtATime()

{

int x = 15;

turnEverythingOff();

for(int y = 0; y<5; y++)

{

//0-3

for(int count = 4; count != 0; count--)

{

digitalWrite(layer[count-1], 1);

for(int i = 0; i<4; i++)

{

digitalWrite(column[i], 0);

delay(x);

digitalWrite(column[i], 1);

delay(x);

}

digitalWrite(layer[count-1], 0);

}

//4-7

for(int count = 0; count < 4; count++)

{

digitalWrite(layer[count], 1);

for(int i = 4; i<8; i++)

{

digitalWrite(column[i], 0);

delay(x);

digitalWrite(column[i], 1);

delay(x);

}

digitalWrite(layer[count], 0);

}

//8-11

for(int count = 4; count != 0; count--)

{

digitalWrite(layer[count-1], 1);

for(int i = 8; i<12; i++)

{

digitalWrite(column[i], 0);

delay(x);

digitalWrite(column[i], 1);

delay(x);

}

digitalWrite(layer[count-1], 0);

}

//12-15

for(int count = 0; count < 4; count++)

{

digitalWrite(layer[count], 1);

for(int i = 12; i<16; i++)

{

digitalWrite(column[i], 0);

delay(x);

digitalWrite(column[i], 1);

delay(x);

}

digitalWrite(layer[count], 0);

}

}

}