// 20 Led's and 5 Tunes -D9-Scorpio

//Pat McMahon 3/12/2020

//A031

//The following removes the need to instal the "pitches.h" library by defining the various notes.

#define NOTE\_B0 31

#define NOTE\_C1 33

#define NOTE\_CS1 35

#define NOTE\_D1 37

#define NOTE\_DS1 39

#define NOTE\_E1 41

#define NOTE\_F1 44

#define NOTE\_FS1 46

#define NOTE\_G1 49

#define NOTE\_GS1 52

#define NOTE\_A1 55

#define NOTE\_AS1 58

#define NOTE\_B1 62

#define NOTE\_C2 65

#define NOTE\_CS2 69

#define NOTE\_D2 73

#define NOTE\_DS2 78

#define NOTE\_E2 82

#define NOTE\_F2 87

#define NOTE\_FS2 93

#define NOTE\_G2 98

#define NOTE\_GS2 104

#define NOTE\_A2 110

#define NOTE\_AS2 117

#define NOTE\_B2 123

#define NOTE\_C3 131

#define NOTE\_CS3 139

#define NOTE\_D3 147

#define NOTE\_DS3 156

#define NOTE\_E3 165

#define NOTE\_F3 175

#define NOTE\_FS3 185

#define NOTE\_G3 196

#define NOTE\_GS3 208

#define NOTE\_A3 220

#define NOTE\_AS3 233

#define NOTE\_B3 247

#define NOTE\_C4 262

#define NOTE\_CS4 277

#define NOTE\_D4 294

#define NOTE\_DS4 311

#define NOTE\_E4 330

#define NOTE\_F4 349

#define NOTE\_FS4 370

#define NOTE\_G4 392

#define NOTE\_GS4 415

#define NOTE\_A4 440

#define NOTE\_AS4 466

#define NOTE\_B4 494

#define NOTE\_C5 523

#define NOTE\_CS5 554

#define NOTE\_D5 587

#define NOTE\_DS5 622

#define NOTE\_E5 659

#define NOTE\_F5 698

#define NOTE\_FS5 740

#define NOTE\_G5 784

#define NOTE\_GS5 831

#define NOTE\_A5 880

#define NOTE\_AS5 932

#define NOTE\_B5 988

#define NOTE\_C6 1047

#define NOTE\_CS6 1109

#define NOTE\_D6 1175

#define NOTE\_DS6 1245

#define NOTE\_E6 1319

#define NOTE\_F6 1397

#define NOTE\_FS6 1480

#define NOTE\_G6 1568

#define NOTE\_GS6 1661

#define NOTE\_A6 1760

#define NOTE\_AS6 1865

#define NOTE\_B6 1976

#define NOTE\_C7 2093

#define NOTE\_CS7 2217

#define NOTE\_D7 2349

#define NOTE\_DS7 2489

#define NOTE\_E7 2637

#define NOTE\_F7 2794

#define NOTE\_FS7 2960

#define NOTE\_G7 3136

#define NOTE\_GS7 3322

#define NOTE\_A7 3520

#define NOTE\_AS7 3729

#define NOTE\_B7 3951

#define NOTE\_C8 4186

#define NOTE\_CS8 4435

#define NOTE\_D8 4699

#define NOTE\_DS8 4978

//#include "pitches.h" //sets up program to recognize the pitches.h tab- REMOVED

// notes in the melody Darth Vader's Theme Song

int melody1[] = {

 NOTE\_G4, NOTE\_G4, NOTE\_G4, NOTE\_DS4, NOTE\_AS4, NOTE\_G4, NOTE\_DS4, NOTE\_AS4, NOTE\_G4, NOTE\_D5, NOTE\_D5, NOTE\_D5, NOTE\_DS5, NOTE\_AS4, NOTE\_FS4, NOTE\_DS4, NOTE\_AS4, NOTE\_G4, NOTE\_G5, NOTE\_G4, NOTE\_G4, NOTE\_G5, NOTE\_FS5, NOTE\_F5, NOTE\_E5, NOTE\_DS5, NOTE\_E5, 0, NOTE\_GS4, NOTE\_CS5, NOTE\_C5, NOTE\_B4, NOTE\_AS4, NOTE\_A4, NOTE\_AS4, 0, NOTE\_DS4, NOTE\_FS4, NOTE\_DS4, NOTE\_FS4, NOTE\_AS4, NOTE\_G4, NOTE\_AS4, NOTE\_D5, NOTE\_G5, NOTE\_G4, NOTE\_G4, NOTE\_G5, NOTE\_FS5, NOTE\_F5, NOTE\_E5, NOTE\_DS5, NOTE\_E5, 0, NOTE\_GS4, NOTE\_CS5, NOTE\_C5, NOTE\_B4, NOTE\_AS4, NOTE\_A4, NOTE\_AS4, 0, NOTE\_DS4, NOTE\_FS4, NOTE\_DS4, NOTE\_AS4, NOTE\_G4, NOTE\_DS4, NOTE\_AS4, NOTE\_G4

};

// note durations for Darth Vader's Theme Song: 4 = quarter note, 8 = eighth note, etc.:

int noteDurations1[] = {

 4, 4, 4, 6, 16, 4, 6, 16, 2, 4, 4, 4, 6, 16, 4, 6, 16, 2, 4, 6, 16, 4, 6, 16, 16, 16, 8, 8, 8, 4, 6, 16, 16, 16, 8, 8, 8, 4, 6, 16, 4, 6, 16, 2, 4, 6, 16, 4, 6, 16, 16, 16, 8, 8, 8, 4, 6, 16, 16, 16, 8, 8, 8, 4, 6, 16, 4, 6, 16, 2,

};

// Notes in the melody Cantina Band

int melody2[] = {

 NOTE\_A4, 0, NOTE\_D5, 0, NOTE\_A4, 0, NOTE\_D5, 0, NOTE\_A4, NOTE\_D5, 0, NOTE\_A4, 0, 0, NOTE\_GS4, NOTE\_A4, 0, NOTE\_A4, NOTE\_GS4, NOTE\_A4, NOTE\_G4, 0, NOTE\_FS4, NOTE\_G4, NOTE\_FS4, NOTE\_F4, NOTE\_D4, NOTE\_A4, 0, NOTE\_D5, 0, NOTE\_A4, 0, NOTE\_D5, 0, NOTE\_A4, NOTE\_D5, 0, NOTE\_A4, 0, 0, NOTE\_GS4, NOTE\_A4, 0, NOTE\_G4, 0, NOTE\_G4, NOTE\_FS4, NOTE\_G4, 0, NOTE\_C5, NOTE\_AS4, NOTE\_A4, NOTE\_G4, NOTE\_A4, 0, NOTE\_D5, 0, NOTE\_A4, 0, NOTE\_D5, 0, NOTE\_A4, NOTE\_D5, 0, NOTE\_A4, 0, 0, NOTE\_GS4, NOTE\_A4, 0, NOTE\_C5, 0, 0, NOTE\_C5, NOTE\_A4, NOTE\_G4, 0, NOTE\_F4, NOTE\_D4, NOTE\_D4, NOTE\_F4, NOTE\_A4, NOTE\_C5, NOTE\_DS5, NOTE\_D5, NOTE\_GS4, NOTE\_A4, 0, NOTE\_F4, 0

};

// note duration for Cantina Band

int noteDurations2[] = {

 4, 64, 4, 64, 4, 64, 4, 64, 8, 4, 64, 8, 64, 8, 8, 4, 64, 8, 8, 8, 8, 8, 8, 8, 8, 2.666, 1.99, 4, 64, 4, 64, 4, 64, 4, 64, 8, 4, 64, 8, 64, 8, 8, 4, 64, 8, 8, 2.666, 8, 4, 64, 8, 4, 4, 2.666, 4, 64, 4, 64, 4, 64, 4, 64, 8, 4, 64, 8, 64, 8, 8, 4, 64, 8, 64, 8, 2.666, 8, 4, 64, 2.666, 1.99, 2, 2, 2, 2, 4, 4, 8, 4, 64, 4, 2

};

// Notes in the melody Love Theme: Anakin and Padme

int melody3[] = {

 NOTE\_A4, NOTE\_F5, NOTE\_D5, NOTE\_G5, NOTE\_F5, NOTE\_E5, NOTE\_F5, NOTE\_D5, NOTE\_F5, NOTE\_E5, NOTE\_D5, NOTE\_E5, NOTE\_C5, NOTE\_D5, NOTE\_C5, NOTE\_A4, NOTE\_A4, NOTE\_F5, NOTE\_D5, NOTE\_D5, NOTE\_E5, NOTE\_F5, NOTE\_G5, NOTE\_E5, NOTE\_A5, NOTE\_G5, NOTE\_A5, NOTE\_A5, NOTE\_C6, NOTE\_AS5, NOTE\_A5, NOTE\_G5, NOTE\_G5, NOTE\_A5, NOTE\_AS5, NOTE\_AS5, NOTE\_G5, NOTE\_C6, NOTE\_AS5, NOTE\_A5, NOTE\_G5, NOTE\_FS5, NOTE\_A5, NOTE\_D6, NOTE\_D4, NOTE\_F4, NOTE\_E4, NOTE\_D4, NOTE\_C4, NOTE\_C4, NOTE\_D4, NOTE\_E4, NOTE\_E4, NOTE\_C4, NOTE\_F4, NOTE\_E4, NOTE\_D4, NOTE\_C4, NOTE\_B3, NOTE\_D4, NOTE\_G4

};

// note duration for Love Theme

int noteDurations3[] = {

 2, 1.3, 2, 3, 3, 3, 2, 2, 3, 3, 3, 2, 2, 1, 2, 1, 2, 1, 2, 3, 3, 3, 2, 2, 2, 1, 1, 2, 1.6, 4, 4, 4, 3, 3, 3, 2, 2, 1.6, 4, 4, 4, 4, 4, 2, 2, 1.6, 4, 4, 4, 3, 3, 3, 2, 2, 1.6, 4, 4, 4, 4, 4, 1

};

// notes in the melody Duel of the Fates

int melody4[] = {

 NOTE\_F3, NOTE\_G3, NOTE\_F3, NOTE\_DS3, NOTE\_D3, NOTE\_F3, NOTE\_G3, NOTE\_F3, NOTE\_DS3, NOTE\_D3, NOTE\_F3, NOTE\_G3, NOTE\_F3, NOTE\_DS3, NOTE\_D3, NOTE\_F3, NOTE\_G3, NOTE\_F3, NOTE\_DS3, NOTE\_D3, NOTE\_E4, NOTE\_FS4, NOTE\_G4, NOTE\_A4, NOTE\_B3, NOTE\_A4, NOTE\_G4, NOTE\_FS4, NOTE\_E4, 0, NOTE\_E4, NOTE\_FS4, NOTE\_G4, NOTE\_A4, NOTE\_B3, NOTE\_A4, NOTE\_G4, NOTE\_FS4, NOTE\_E4, 0, NOTE\_DS4, NOTE\_E4, NOTE\_FS4, NOTE\_G4, NOTE\_A4, NOTE\_B4, NOTE\_A4, NOTE\_G4, NOTE\_FS4, 0, NOTE\_DS4, NOTE\_E4, NOTE\_FS4, NOTE\_G4, NOTE\_A4, NOTE\_G4, NOTE\_FS4, NOTE\_E4, NOTE\_DS4

};

// note duration for Duel of the Fates

int noteDurations4[] = {

 8, 8, 16, 16, 8, 8, 8, 16, 16, 8, 8, 8, 16, 16, 8, 8, 8, 16, 16, 8, 8, 8, 4, 4, 4, 4, 8, 8, 4, 4, 8, 8, 4, 4, 4, 4, 8, 8, 4, 4, 8, 8, 4, 4, 4, 4, 8, 8, 4, 4, 8, 8, 4, 4, 4, 4, 8, 8, 1

};

// notes in melody May the Force be with You

int melody5[] = {

 NOTE\_G3, NOTE\_C4, NOTE\_D4, NOTE\_DS4, NOTE\_F4, NOTE\_DS4, NOTE\_G3, NOTE\_G3, NOTE\_C4, NOTE\_D4, NOTE\_DS4, NOTE\_G3, NOTE\_DS4, NOTE\_C4, NOTE\_G4, NOTE\_F4, 0, NOTE\_G3, NOTE\_C4, NOTE\_D4, NOTE\_DS4, NOTE\_G3, NOTE\_G4, NOTE\_DS4, NOTE\_C5, NOTE\_C4, NOTE\_DS4, NOTE\_D4, NOTE\_C4, NOTE\_G4, NOTE\_DS4, NOTE\_C4, NOTE\_G3, NOTE\_G3, NOTE\_G3, NOTE\_C4, 0

};

// Note duration for May the Force Be with You

int noteDurations5[] = {

 2, 1, 1.333, 8, 8, 1, 1.333, 4, 1.333, 4, 4, 4, 3, 3, 3, 1, 2, 2, 1.333, 4, 1.333, 8, 1.333, 8, 1, 2, 3, 3, 3, 1.2, 3, 3, 2, 1.333, 8, 1, 2

};

int buzzer = 9; // hooks up the speaker to pin D9

int timer = 400; // The higher the number, the slower the timing.

void setup()

{

 Serial.begin(9600);

 pinMode(buzzer, OUTPUT); // sets the speaker as an output

 {

 // use a for loop to initialize each pin as an output:

 for (int thisPin = 2; thisPin < 20; thisPin++)

 {

 pinMode(thisPin, OUTPUT);

 }

 }

}

void loop() {

 // loop from the lowest pin to the highest:

 for (int thisPin = 0; thisPin < 20; thisPin++) {

 // turn the pin on:

 digitalWrite(thisPin, HIGH);

 delay(timer);

 // turn the pin off:

 digitalWrite(thisPin, LOW);

 }

 // loop from the highest pin to the lowest:

 for (int thisPin = 20; thisPin >= 0; thisPin--) {

 // turn the pin on:

 digitalWrite(thisPin, HIGH);

 delay(timer);

 // turn the pin off:

 digitalWrite(thisPin, LOW);

 }

 Serial.print("Duel of the Fates");

 for (int thisNote = 0; thisNote < 59; thisNote++) { // for the 59 notes being played... this is what happens

 int noteDuration4 = 1000 / noteDurations4[thisNote]; // sets up the note duration for Duel of the Fates

 tone(buzzer, melody4[thisNote], noteDuration4); // tells the buzzer to play Duel of the Fates

 int pauseBetweenNotes4 = noteDuration4 \* 1.40; // sets the tempo

 delay(pauseBetweenNotes4); // pauses the buzzer

 noTone(buzzer); // stops the buzzer

 }

 delay(2000);

 Serial.print("Darth Vader's Theme Song");

 for (int thisNote = 0; thisNote < 70; thisNote++) { // for 70 notes... this is what happens

 int noteDuration1 = 1000 / noteDurations1[thisNote]; // sets up note duration for Darth Vader's Theme

 tone(buzzer, melody1[thisNote], noteDuration1); // tells the buzzer to play Darth Vader's Theme

 int pauseBetweenNotes = noteDuration1 \* 1.60; // sets the tempo for the song

 delay(pauseBetweenNotes); // pauses the buzzer

 noTone(buzzer); // stops the buzzer playing

 }

 delay(2000);

 Serial.print("May the Force Be With You");

 for (int thisNote = 0; thisNote < 36; thisNote++) { // for 36 notes this is what happens

 int noteDuration5 = 1000 / noteDurations5[thisNote]; // defines the note duration for may the force be with you

 tone(buzzer, melody5[thisNote], noteDuration5); // tells the buzzer to play may the force be with you

 int pauseBetweenNotes5 = noteDuration5 \* 1.1; // sets the tempo

 delay(pauseBetweenNotes5); //pauses the buzzer

 noTone(buzzer); // stops the buzzer

 }

 delay(2000);

 Serial.print("Cantina Band");

 for (int thisNote = 0; thisNote < 91; thisNote++) { // for 91 notes, this is what happens

 int noteDuration2 = 1000 / noteDurations2[thisNote]; // defines note duration for cantina band

 tone(buzzer, melody2[thisNote], noteDuration2); // tells the buzzer to play the cantina band melody

 int pauseBetweenNotes2 = noteDuration2 \* 0.80; // sets the tempo

 delay(pauseBetweenNotes2); //pauses the buzzer

 noTone(buzzer); // stops the buzzer playing

 }

 delay(2000);

 Serial.print("Anakin and Padme");

 for (int thisNote = 0; thisNote < 61; thisNote++) { // for 61 notes this is what happens

 int noteDuration3 = 1000 / noteDurations3[thisNote]; // defines note duration for love theme

 tone(buzzer, melody3[thisNote], noteDuration3); // tells the buzzer to play love theme

 int pauseBetweenNotes3 = noteDuration3 \* 1.10; // sets the tempo

 delay(pauseBetweenNotes3); // pauses the buzzer

 noTone(buzzer); // stops the buzzer

 }

 delay(2000);

}