SIK Keyboard Code

```
/**
 * SparkFun Inventor's Kit Project
 * Keyboard Instrument
 * Date: March 29, 2016
 *
 * Description:
 *  Use the soft touch potentiometer as a keyboard segmented into
 *  8 keys: C, D, E, F, G, A, B, C. When each key is pressed, the
 *  corresponding note is played through a buzzer.
 *
 * Hardware Connections:
 *  Arduino | Soft Pot | Buzzer
 *  --------------------------
 *   5V    |  pin 3 |
 *   A0    |  pin 2 |
 *   GND   |  pin 1 |
 *   9  |       | +
 *   GND  |       | -
 *
 *  You will also need to attach a 10k resistor from pin 2 to
 *  pin 1 (GND) on the soft pot.
 *
 * License:
 *  Public Domain
 */

// Constants
const int SENSOR_PIN = 0;  // Analog input pin for soft pot
const int BUZZER_PIN = 9;  // PWM digital output pin for buzzer
const int DURATION = 10;    // Time (ms) to play a note

// This function is run only once as soon as the Arduino boots
void setup()
{

  // Set the buzzer pin as an output
  pinMode(BUZZER_PIN, OUTPUT);
}

// This gets run over and over right after the setup() function
void loop()
{
  int sensorValue;
  char note = 0;
  int freq;
```

```
  // Read the value (0 - 1023) from the ADC
  sensorValue = analogRead(SENSOR_PIN);

  // Map the key pressed to a note
  note = findNote(sensorValue);

  // If it's a note, play it!
  if ( note != 0 ) {
    freq = getFrequency(note);
    tone(BUZZER_PIN, freq, DURATION);
    delay(DURATION);
  }
}

// Given an ADC value (0 - 1023), map it to a note
char findNote(int val)
{

  // Return the note based on the key pressed
  if ( (val > 10) && (val <= 160) )
  {
    return 'c';
  }
  if ( (val > 160) && (val <= 250) )
  {
    return 'd';
  }
  if ( (val > 250) && (val <= 350) )
  {
    return 'e';
  }
  if ( (val > 350) && (val <= 450) )
  {
    return 'f';
  }
  if ( (val > 450) && (val <= 560) )
  {
    return 'g';
  }
  if ( (val > 560) && (val <= 690) )
  {
    return 'a';
  }
  if ( (val > 690) && (val <= 850) )
  {
    return 'b';
  }
```

```
    if ( (val > 850) && (val <= 1023) )
    {
      return 'C';
    }

    // Return 0 to show that no key was pressed
    return 0;
}

// Translate a note (a, b, c, d, e, f, g) to its frequency
int getFrequency(char note)
{
  int i;
  const int numNotes = 8;  // number of notes we're storing

  // Arrays containing our notes and frequencies
  char names[] = { 'c', 'd', 'e', 'f', 'g', 'a', 'b', 'C' };
  int frequencies[] = {262, 294, 330, 349, 392, 440, 494, 523};

  // Step though the notes
  for (i = 0; i < numNotes; i++)  // Step through the notes
  {

    // If it matches a note in our list, return the frequency
    if (names[i] == note)
    {
      return(frequencies[i]);
    }
  }

  // If we looked through everything and didn't find a note,
  // return 0, as we still need to return something.
  return(0);
}
```