```
    1: #include <SFML/Graphics.hpp>
    2: #include <SFML/System.hpp>
    3: #include <SFML/Audio.hpp>
    4: #include <SFML/Window.hpp>
    5:
    6: #include <math.h>
    7: #include <limits.h>
    8:
    9: #include <iostream>
   10: #include <string>
   11: #include <exception>
   12: #include <stdexcept>
   13: #include <vector>
   14:
   15: #include "CircularBuffer.hpp"
   16: #include "StringSound.hpp"
   17:
   18: #define CONCERT_A 440.0
   19: #define SAMPLES_PER_SEC 44100
   20: const int keyboard_size = 37;
   21:
   22: std::vector<sf::Int16> makeSamples(StringSound gs)
   23: {
   24:     std::vector<sf::Int16> samples;
   25:
   26:     gs.pluck();
   27:     int duration = 8; // seconds
   28:     int i;
   29:     for (i = 0; i < SAMPLES_PER_SEC * duration; i++) {
   30:         gs.tic();
   31:         samples.push_back(gs.sample());
   32:     }
   33:
   34:     return samples;
   35: }
   36:
   37: int main()
   38: {
   39:     sf::RenderWindow window(sf::VideoMode(800, 800), "SFML KSGuitarSim");
   40:     sf::Event event;
   41:
   42:     double frequency;
   43:     std::vector<sf::Int16> sample;
   44:
   45:     std::vector<std::vector<sf::Int16>> samples(keyboard_size);
   46:     std::vector<sf::SoundBuffer> buffers(keyboard_size);
   47:     std::vector<sf::Sound> sounds(keyboard_size);
   48:
   49:     std::string keyboard = "q2we4r5ty7u8i9op-[=zxdcfvgbnjmk,.;/' ";
   50:
   51:     for (int i = 0; i < (signed)keyboard.size(); i++) {
   52:         frequency = CONCERT_A * pow(2, ((i - 24) / 12.0));
   53:         StringSound tmp = StringSound(frequency);
   54:
   55:         sample = makeSamples(tmp);
   56:         samples[i] = sample;
   57:
   58:         if (!buffers[i].loadFromSamples(&samples[i][0],
   59:                                         samples[i].size(), 2, SAMPLES_PER
_SEC)) {
   60:             throw std::runtime_error("sf::SoundBuffer: failed to load fro
m samples.");
   61:         }
   62:
   63:         sounds[i].setBuffer(buffers[i]);
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    64:     }
    65:
    66:     while (window.isOpen()) {
    67:         while (window.pollEvent(event)) {
    68:             if (event.type == sf::Event::TextEntered) {
    69:                 if (event.text.unicode < 128) {
    70:                     char key = static_cast<char>(event.text.unicode);
    71:
    72:                     for (int i = 0; i < (signed)keyboard.size(); i++) {
    73:                         if (keyboard[i] == key) {
    74:                             std::cout << "Keyboard key is: " << keyboard[
i] << "\n";
    75:                             std::cout << "Attempting to play sound...\n";
    76:                             sounds[i].play();
    77:                             break;
    78:                         }
    79:                     }
    80:                 }
    81:             }
    82:
    83:             if (event.type == sf::Event::Closed) {
    84:                 window.close();
    85:             }
    86:         }
    87:
    88:         window.clear();
    89:         window.display();
    90:     }
    91:     return 0;
    92: }
```