Audio Processing on Open Source Cross-Platform Libraries.
PortAudio

PortAudio

- Free.

- Cross Platform (Windows, Macintosh OS X, Linux).

- C library - Callback based.

- Simple to use

Getting PortAudio

http://www.portaudio.com/ ⟶ Download

Get   pa_stable_v19_20071207.tar.gz

Compiling PortAudio

Mac using gcc

From the shell on the port audio directory:
./configure && make

libportaudio.a is created on the hiden folder :
portaudio/lib/.libs

Windows using Visual Studio and wmme

Open the project located on :
portaudio/build/msvc/portaudio.sln

On the Project tree delete :
Hostapi → ASIO
Hostapi →dsound
Hostapi →wasapi

On Project Properties -> C/C++ → Preprocesor → Preprocesor definitions add:
PA_NO_DS   and PA_NO_ASIO

On Project Properties -> Linker → Input → Additional dependencies   add: winmm.lib

On portaudio.def Delete all the lines starting with PaAsio

Build Solution (f7)

The files portaudio_x86.dll and portaudio_x86.lib are created

Compiling a PortAudio application

Mac using gcc

From the shell on the home directory: (Assuming portAudio on $HOME/PA/portaudio)

```
gcc -o TestSW
$HOME/PA/portaudio/test/patest_saw.c
libportaudio.a
-framework CoreAudio -framework
AudioToolbox -framework AudioUnit
-framework CoreServices
-I$HOME/PA/portaudio/include
```

For c++ programs use g++ instead of gcc

Windows using Visual Studio and wmme

Create a new win32 console application

On "Application Settings" select a console application empty project

Copy portaudio_x86.dll, portaudio_x86.lib and the application source code to the new project directory

On the Project tree add the source code

Add the directory of portaudio.h on the compile directory search.

On Project Properties -> Linker → Input → Additional dependencies   add: potaudio_x86.lib

Build Solution (f7)

Run the program (f5)

Example 1. Karplus – Strong algorithm

Example 2. Maraca algorithm

Example 3. Input Processing

Other Cross-Platform Audio Libraries

RTaudio

http://www.music.mcgill.ca/~gary/rtaudio/

Juce

http://www.rawmaterialsoftware.com/juce.php

Some Other Audio related C libraries

Libsndfile (File input/output)

http://www.mega-nerd.com/libsndfile/

Libtsp (Signal Processing)

http://www-mmsp.ece.mcgill.ca/documents/Software/Packages/libtsp/libtsp.html

Structure of a PortAudio application

```
static int patestCallback( const void *inputBuffer, void *outputBuffer, unsigned long framesPerBuffer,
                const PaStreamCallbackTimeInfo* timeInfo, PaStreamCallbackFlags statusFlags,
                void *userData ) {
                    …
        return 0;

}


void main(void)
{
        // Initialization
        …
        // callback registration
        …
        // Start stream
        …
        // loop

}
```