FLAC Decoder

Statement about the Problem:

Lossy audio formats like MP3, AAC etc. encode audio data in such a way that the original data cannot be obtained by decoding.

Reason/Motivation Behind This Topic:

The loss of sound quality inherent in MP3s is a major issue for many artistsandFLAC files has a much higher audio quality than MP3, AAC, WMA and other lost formats. For example, if FLAC is created from a WAV file, reliability will remain CD quality but 50 to 60 percent smaller in size. This is good for storing CDs and other WAV files. So, basically by using FLAC files we get great Sound Quality in less amount of size.

Objective and scope of the project:

It delivers decent small audio files after compressing it without affecting the sound quality. A unique technique is used by this format to compress and reproduce the file. It is very good for cloud storage such as streaming servers and works wonders for physical storage like hard and flash drives. FLAC files are available for roughly the same price as the equivalent MP3 in online stores and sound much better.

Project Methodology/Summary:

The project is implemented in two parts:

- The decoder itself would be written as a callback function which would load the specified number of audio frames from the FLAC file and write those frames into the given buffer.

- To actually test the output of the decoder itself, we would write a program that uses the decoder to render those audio frames and play the output through the speaker(s).

Part 2 depends upon the operating system since we need to use the required audio API's that the OS provides.

For this implementation we would use Windows 10 as the OS and use WASAPI (IAudioRenderClient interface) for part 2.

Hardware & Software requirements:

1.) Hardware requirements

1 GHz or faster processor or SoC

- RAM: minimum 1 (GB) for 32-bit or 2 GB for 64-bit
- Hard disk space: 16 GB for 32-bit OS or 20 GB for 64-bit OS

2.) Software requirements

Windows 10

Contribution that the project will be able to make:

FLAC (Free Lossless Audio Codec) is a musical file format that offers bit-perfect copies of CDs but at half the size. FLAC uses less space than WAV, and allows more precise tagging, making it ideal as a long-term digital storage medium for audio. Many audiophiles love FLAC for this reason.