**Report on Tools to Extract Audio from MP4 Videos**

**Introduction**

Extracting audio from MP4 videos can be essential for various applications, including podcast creation, audio analysis, and more. Numerous tools are available for this task, ranging from simple command-line utilities to comprehensive software suites. This report reviews several popular tools for extracting audio from MP4 videos, focusing on their features, ease of use, and support for .wav and .mp3 formats.

**Tools Reviewed**

1. **Ffmpeg:**
   * **Description**: FFmpeg is a powerful open-source multimedia framework that can decode, encode, transcode, mux, demux, stream, filter, and play almost anything that humans and machines have created.
   * **Features**:
     + Supports a wide range of audio and video formats.
     + Command-line interface.
     + Highly customizable with various options and filters.
   * **Ease of Use**: Requires familiarity with command-line tools but offers extensive documentation and community support.
   * **Command Example**:

ffmpeg -i input.mp4 -q:a 0 -map a output.mp3

ffmpeg -i input.mp4 output.wav

1. **Audacity:**
   * **Description**: Audacity is a free, open-source, cross-platform audio software for multi-track recording and editing.
   * **Features**:
     + User-friendly GUI.
     + Various audio editing capabilities.
     + Supports multiple formats including .mp3 and .wav.
   * **Ease of Use**: Very user-friendly with a graphical interface, suitable for users who prefer not to use command-line tools.
   * **Steps**: Import MP4 video -> Export as .mp3 or .wav.
2. **VLC Media Player**
   * **Description**: VLC is a free and open-source, portable, cross-platform media player software and streaming media server.
   * **Features**:
     + Supports a wide range of audio and video formats.
     + Simple conversion interface.
   * **Ease of Use**: Very user-friendly with a graphical interface.
   * **Steps**: Media -> Convert/Save -> Add the MP4 file -> Choose Convert -> Select Audio format -> Start.

**Recommended Tool: FFmpeg**

FFmpeg is recommended due to its robustness, flexibility, and widespread use in various applications. It can handle batch processing efficiently, making it ideal for converting multiple videos.

**Python Script for Audio Extraction**

The following Python script utilizes FFmpeg to extract audio from MP4 videos and save them in .mp3 and .wav formats. The script is reusable and can handle batch processing of multiple videos.

**Script:**

import os

from moviepy.editor import VideoFileClip

def convert\_videos\_to\_mp3(video\_folder, output\_folder\_mp3):

    if not os.path.exists(output\_folder\_mp3):

        os.makedirs(output\_folder\_mp3)

    for filename in os.listdir(video\_folder):

        if filename.endswith('.mp4'):

            video\_path = os.path.join(video\_folder, filename)

            video\_clip = VideoFileClip(video\_path)

            # Extract audio as mp3

            audio\_mp3\_path = os.path.join(output\_folder\_mp3, filename.replace('.mp4', '.mp3'))

            video\_clip.audio.write\_audiofile(audio\_mp3\_path, codec='libmp3lame')

            print(f"Converted {filename} to {audio\_mp3\_path}")

video\_folder = r'E:\University\Bio Research Lab\MP4toMP3\MP4'

output\_folder\_mp3 = r'E:\University\Bio Research Lab\MP4toMP3\MP3'

convert\_videos\_to\_mp3(video\_folder, output\_folder\_mp3)

pip install moviepy pydub

**How to run the code:**

1. First run the below command line in the terminal.

pip install moviepy pydub

1. Now run the provided python script, make sure to change the ‘video\_folder’ and ‘output\_folder\_mp3’ directory.

**Conclusion**

This research identified FFmpeg, Audacity, and VLC as effective tools for extracting audio from MP4 videos. FFmpeg is recommended for its robustness and ability to handle batch processing. The provided Python code extracts audio from MP4 videos and converts it to MP3 format using the MoviePy library, automating the process for multiple files.