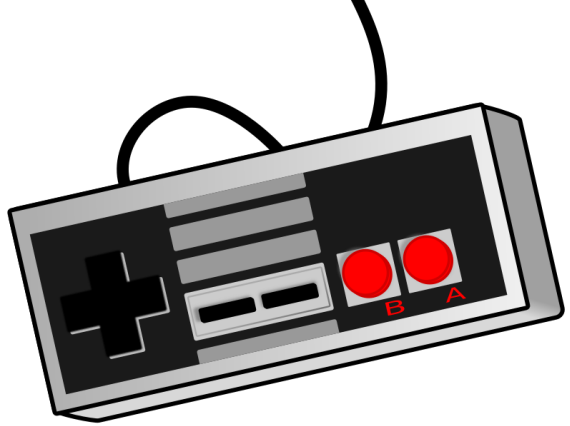


Lab_7

Processing Audio !

420-141-VA - GAME PROGRAMMING 1 - VANIER COLLEGE

Outline

Processing Audio Guidelines and Tools

- Planning for all audio files needed in-game
- Audio Formats and Properties
- Searching audio files on the web
- Foley Artists
- Recording Sounds
- Cropping sounds
- Fading in and out
- Looping music
- Audacity Tutorials

Step 1: Setting up the Sound Files

- Download the **Lab_7.zip** file from Omnivox, which contains 3 sound files.
- Unzip the contents to somewhere on your USB key or hard disk.
- Run **Audacity** Software

To Do

- Open each sound file and play it.

Step 1: Setting up the Sounds (cont.)

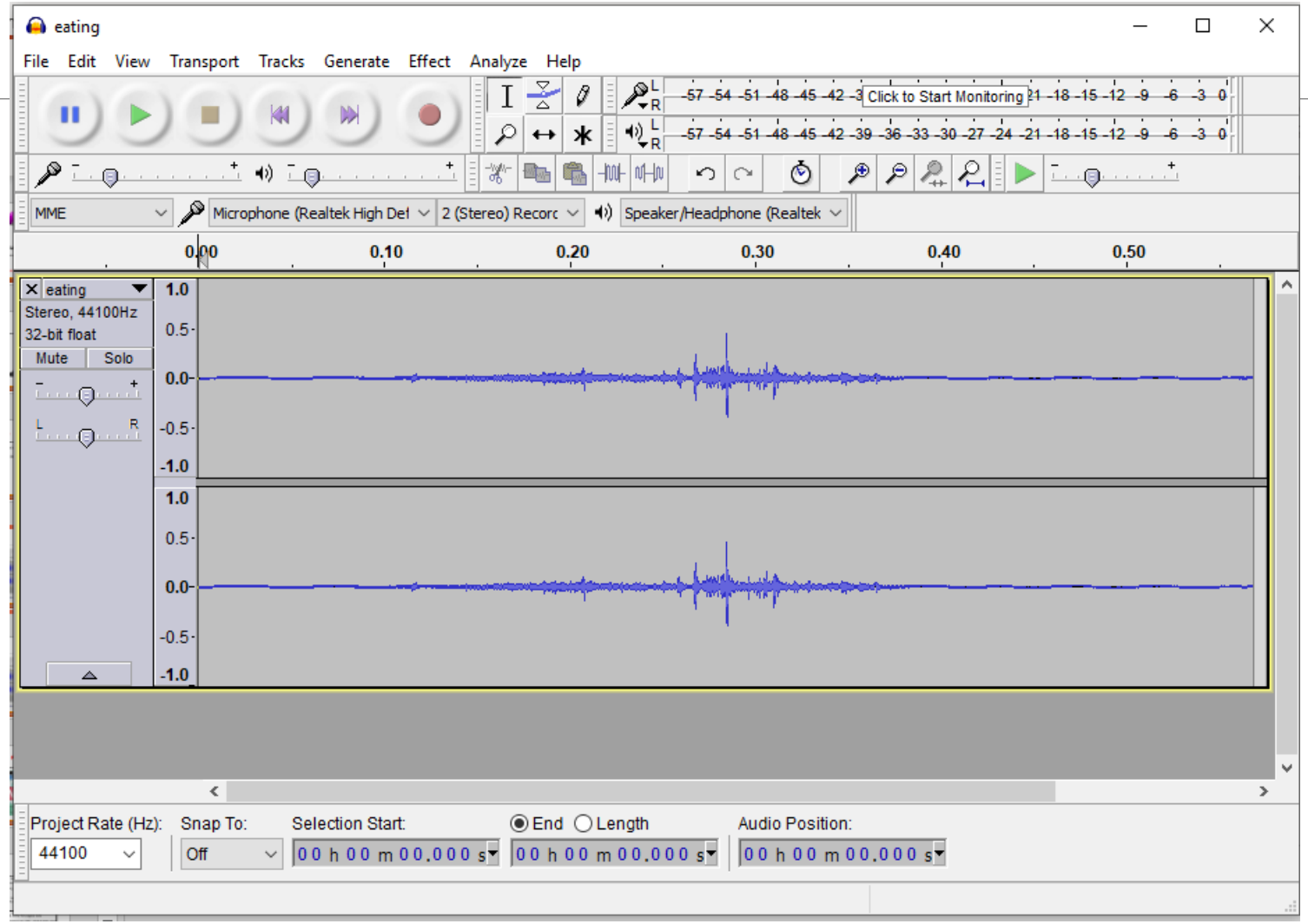


Figure 1

Step 1: Setting up the Sounds (cont.)

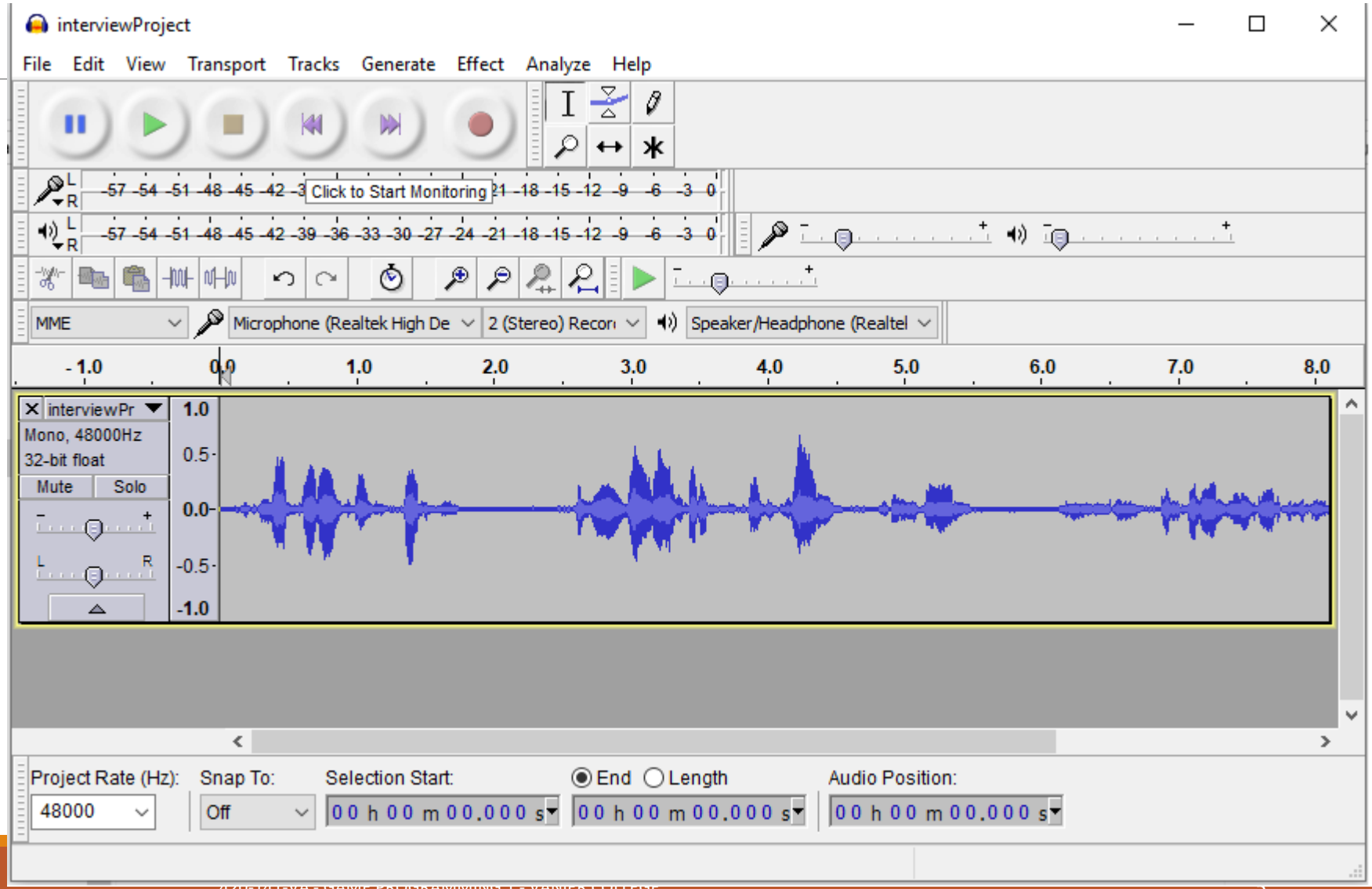


Figure 2

Step 1: Setting up the Sounds (cont.)

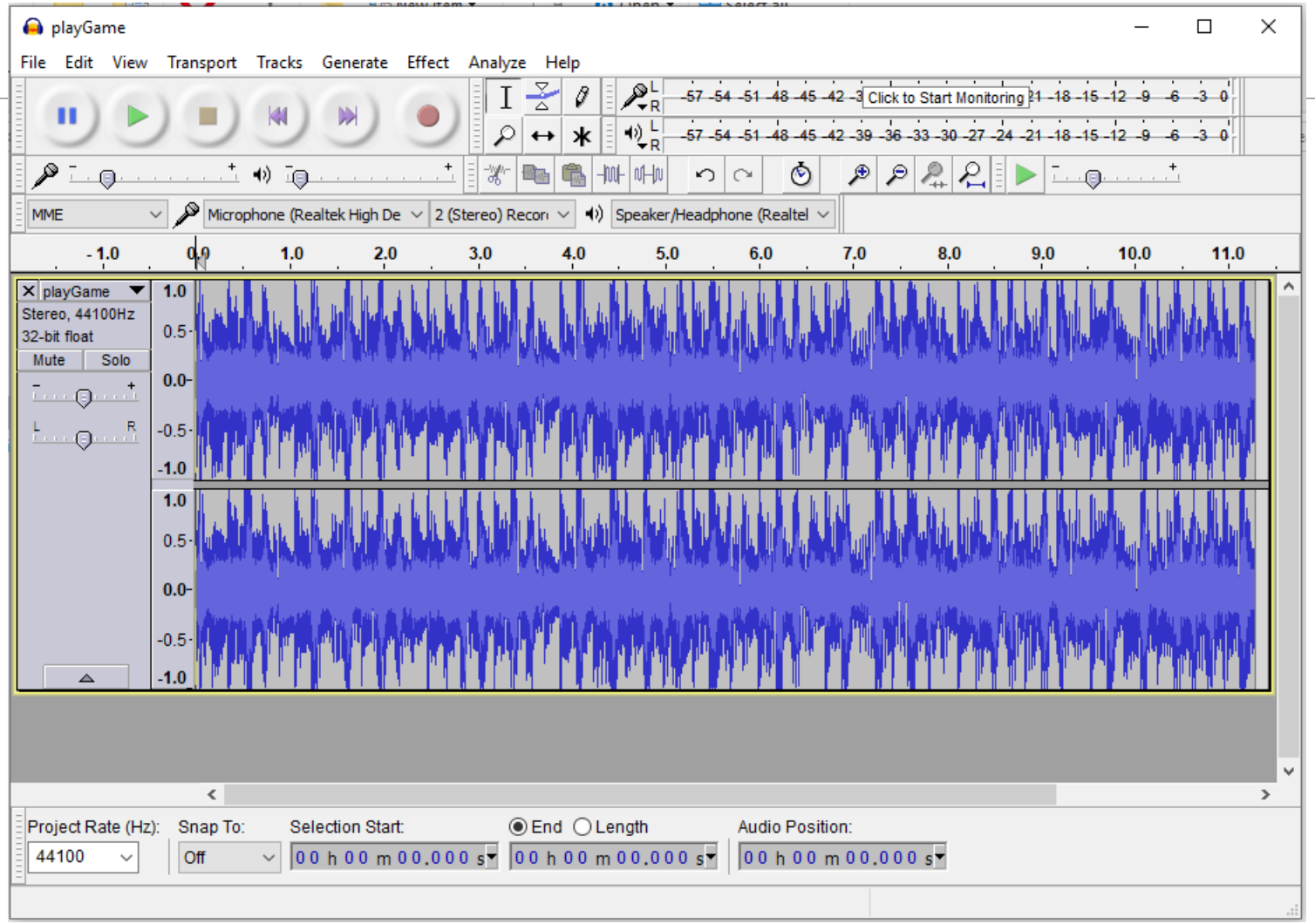


Figure 3

Before an Audio recording session, plan for all Audio files needed in-game!

Audio Formats and Properties

PCM WAV (.wav): Lossless compression (big files for music), supports loop markers, fast to decode. Ideal for sound effects in game. Default format when recording sounds.

MP3 (.mp3): Lossy compression (small files for music), no loop markers. Good support for most audio library.

Ogg Vorbis (.ogg): Lossy compression (small files for music), support for loop markers. This is the most common format for console game music, but less supported than MP3.

- Unfortunately not supported by **Greenfoot**

Lossless Compression: no data is lost, decompressed as the full original data

Lossy Compression: data approximated for higher compression ratio, original data can't be fully recovered after lossy compression.

Searching audio files on the web

Content online is regulated with Licenses, using someone else's work without permission is considered stealing.

Audio contents is owned by the author (musicians, record companies, speeches)

The owner may grant permissions to other people by assigning a license

- **Copyright Notice**: you need written permission to use contents or modify contents
- **Creative Commons License**: right to share, use, and build upon the material
- **Fair Dealing**: is an exception in the **Canadian** Copyright Act (for research, education, etc)
- **Fair use**: Equivalent of Fair Dealing in the USA (overview)

Searching online for individual audio files is often a waste of time, incredibly difficult compared to images, and many sounds will be inconsistent even if they are all individually good.

Audio packs are often available, containing many audio files work well with each other.

Foley Artists for Movies

These guys don't look for audio online!

Look around yourself so you can create the sound effect you need!

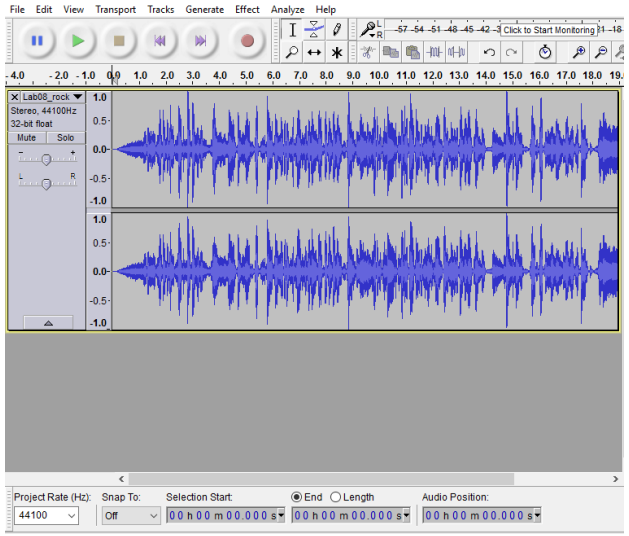
https://www.youtube.com/watch?time_continue=6&v=OONaPcZ4EAs

Audacity – Free Audio Editing Software

When integrating sounds in your game, you should process them the same way you process images to integrate

The goal is to make them ready to use in game

- make them more uniform
- make them more responsive
- make music loop
- make them faster to decode
- use less memory and storage



Advice – Use headphones when editing sounds

- Not only it is irritating for others, but you will hear the audio in greater details.

Step 2: Recording Sounds

Find the most quiet place you can find

Turn off air conditioning units, heating, fans, computers, anything that can generate background noise.

Your mobile phone generally has a pretty good microphone. Using the standard audio recorder, you can generate .wav files that can be processed later on in Audacity.

Step 2: Recording Sounds (cont.)

To Do

a) Record a new Audio message about 6 second "***My name is Full_name, I am excited to learn Audacity***"

b) Export your file as **AudioMessage.wav**

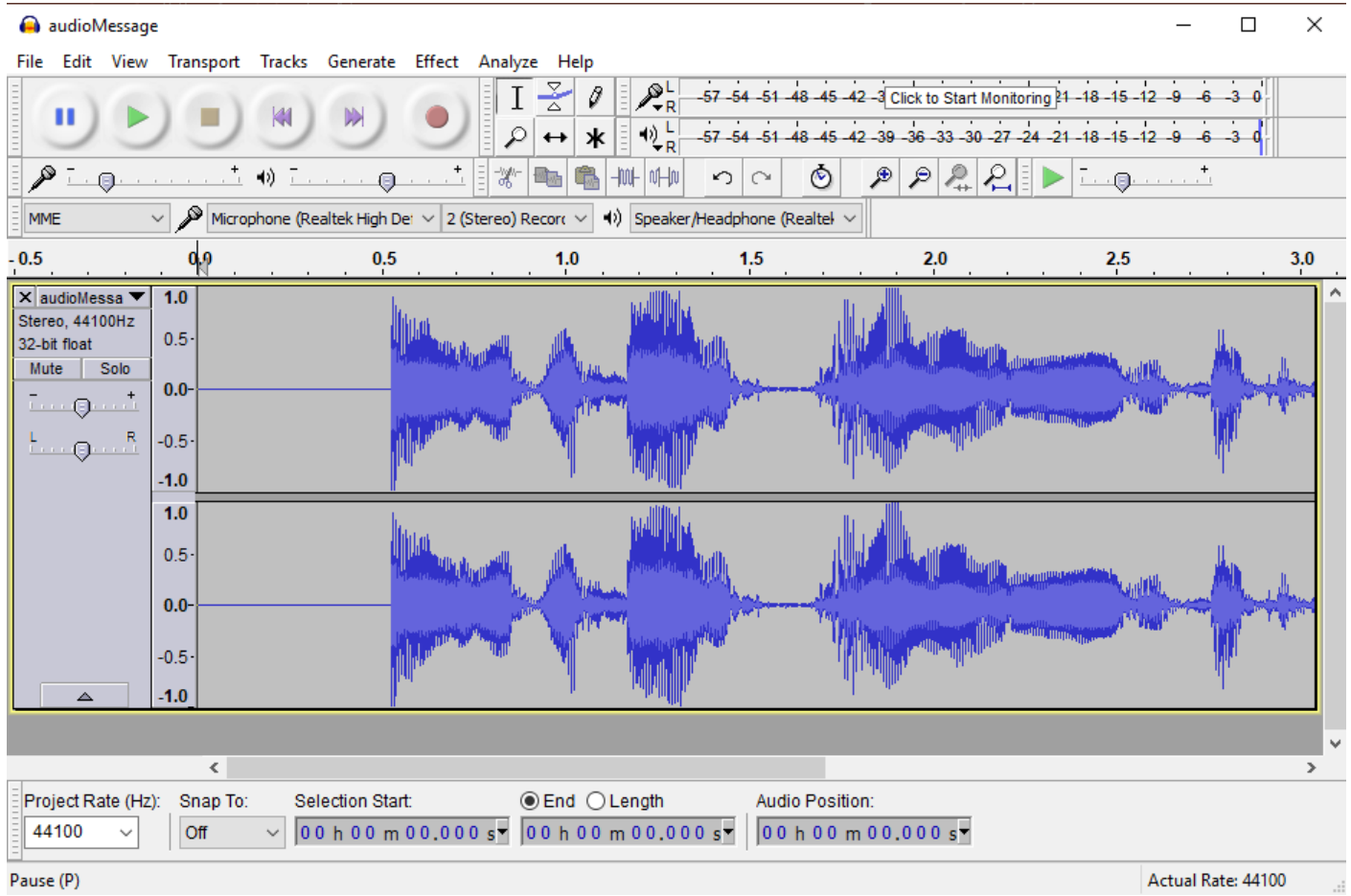


Figure 4

Step 3: Remove the background noise

You still have to **remove the background noise**, even if you use the most expensive equipment, in the most quiet area.

In Audacity, you can use the Noise Removal Effect

- You first will provide the noise profile (blank part of the audio track)
- Then, let Audacity remove the noise for the whole track.
- Tutorial here.

Step 3: Remove the background noise

To Do

a) Open the file **interviewProject.wav**

b) Select the "silent" section of your audio, where it's just noise.

c) Go to the **Effect** menu and click **Noise Reduction**

d) Click **Get Noise Profile**

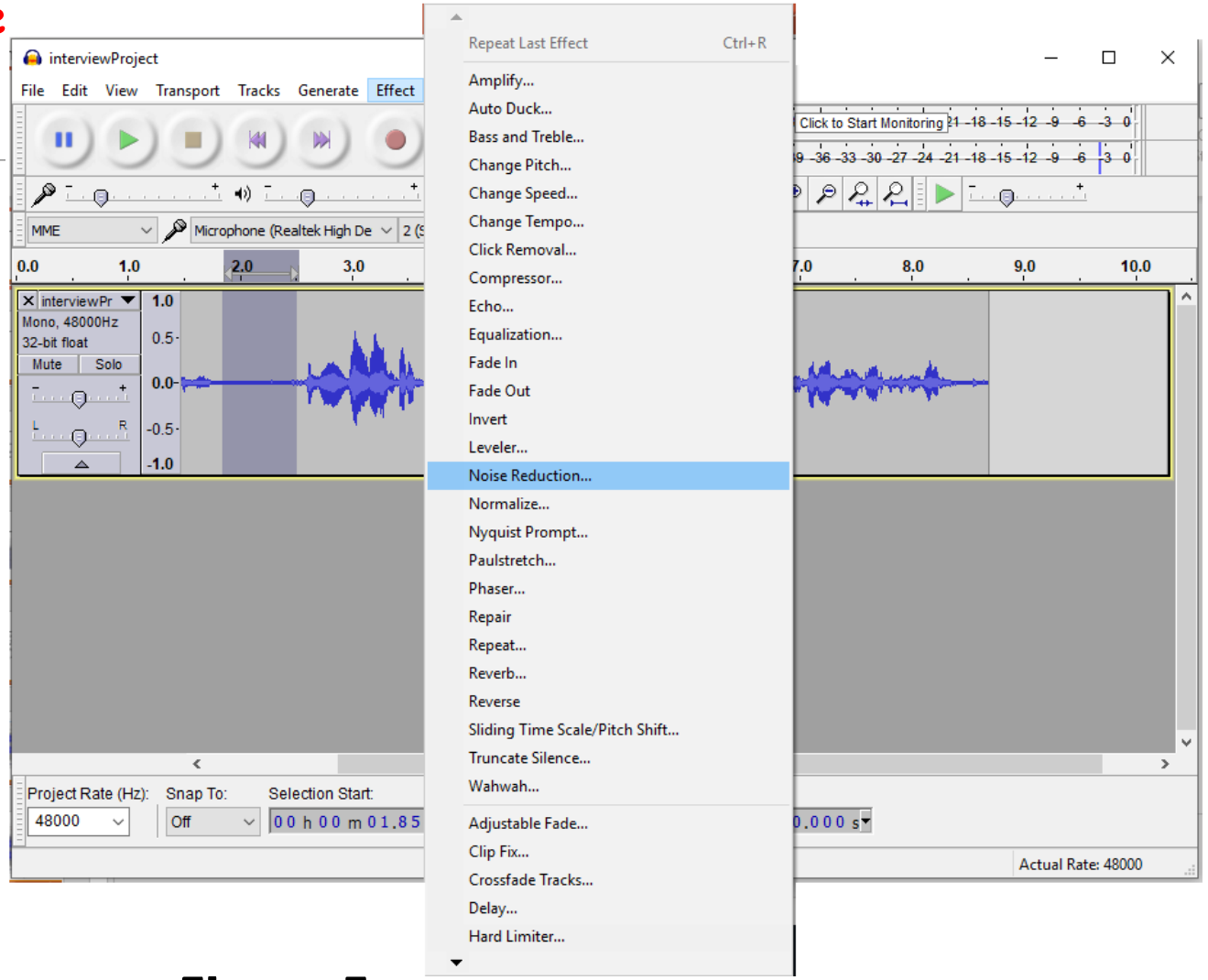


Figure 5a

Step 3: Remove the background noise (cont.)

To Do

e) Select all the audio from which you want that background noise removed. [Edit + Select + All]

f) Go to the **Effect** menu and click **Repeat Noise Removal**.

g) Export your file as **interviewProject_NoiseRemoval .wav**

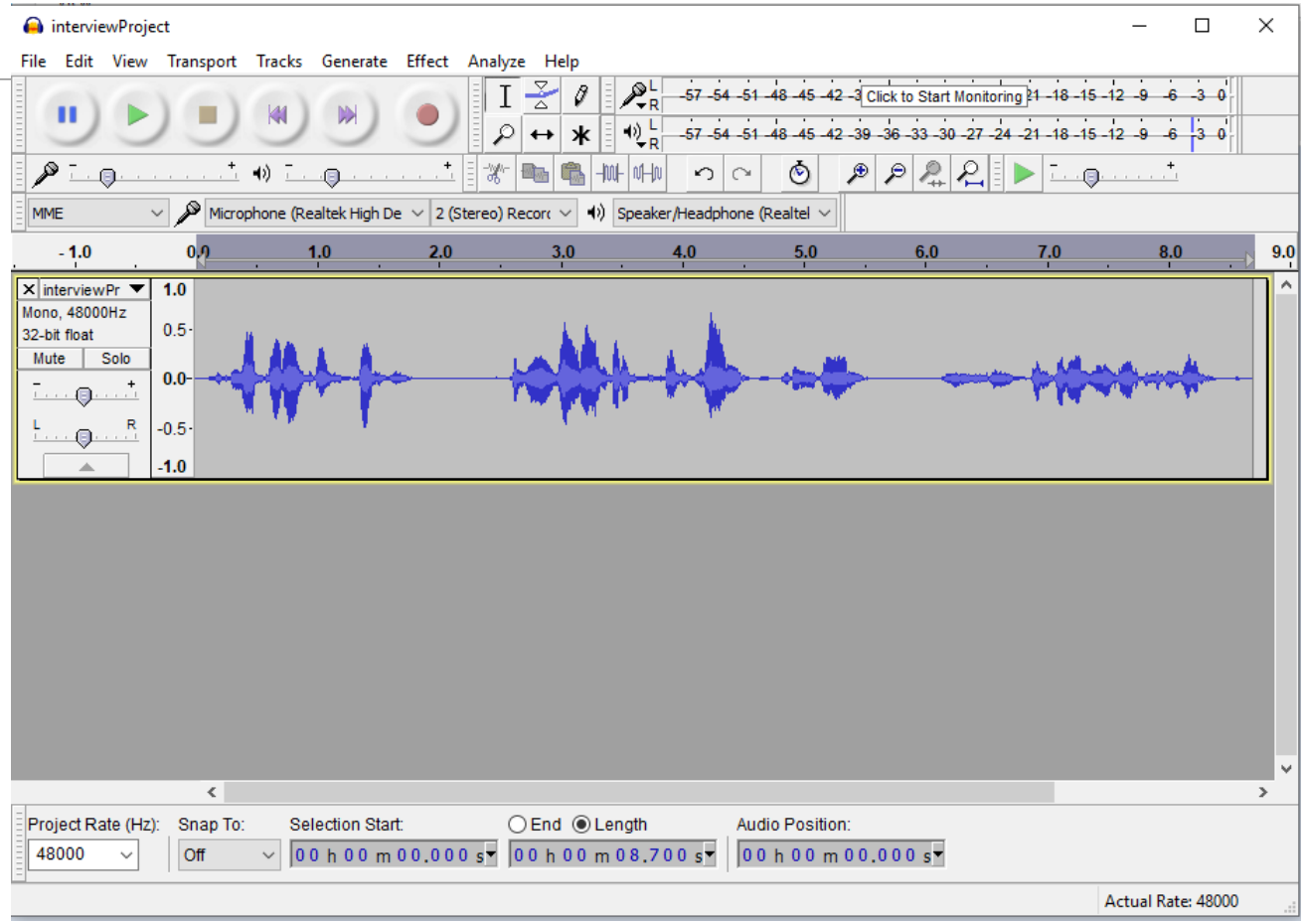


Figure 5b

Step 4: Cropping Sounds

Game sounds have to be responsive

They are normally triggered during Gameplay when an event happens (eg a jump sound when you press the jump button)

Cropping Sounds allow removing as much blank as possible before sound plays

In **Audacity**, you can select the blank section at the beginning of a sound, and press delete.

Step 4: Cropping Sounds (cont.)

To Do

a) Open the file **eating.wav** with **Audacity**

b) Select the blank section (about 0.12 second) at the beginning of the sound

c) Press **delete** key (Through menu: **Edit + Delete)**

d) Export it with filename **eating_Cropped.wav**

e) What is the current sound length?

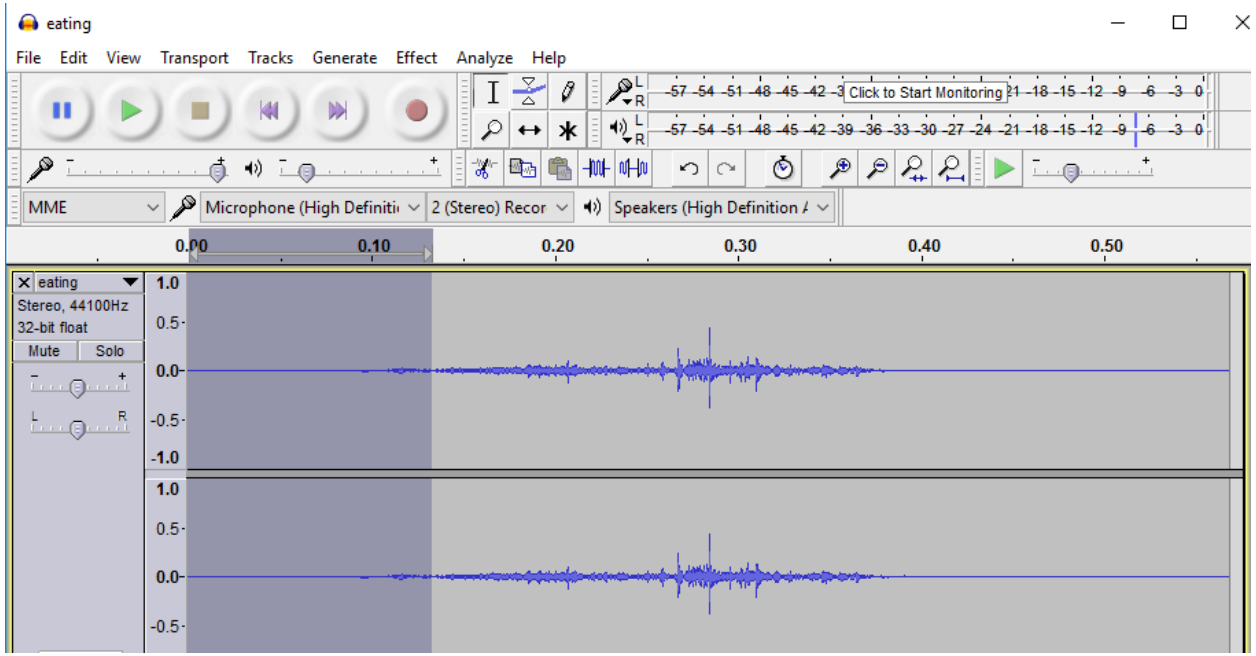


Figure 6

Step 5: Fading in and out

Starting sound with some volume often result in clicks and pops (audio glitch)

To prevent this, you should always start a sound at 0 volume , and gradually increase the volume over time (such as the beginning of most songs)

The **fade-in** effect allows starting at 0 and ramping up the volume, and the **fade out** effect does the opposite.

In **Audacity**, select the region you want to fade in, and apply the fade-in effect.

Step 5: Fading in and out (cont.)

To Do

a) Open the file **playGame.wav** with **Audacity**

b) Select the first 2 seconds to fade in :
[Effect + Fade In]

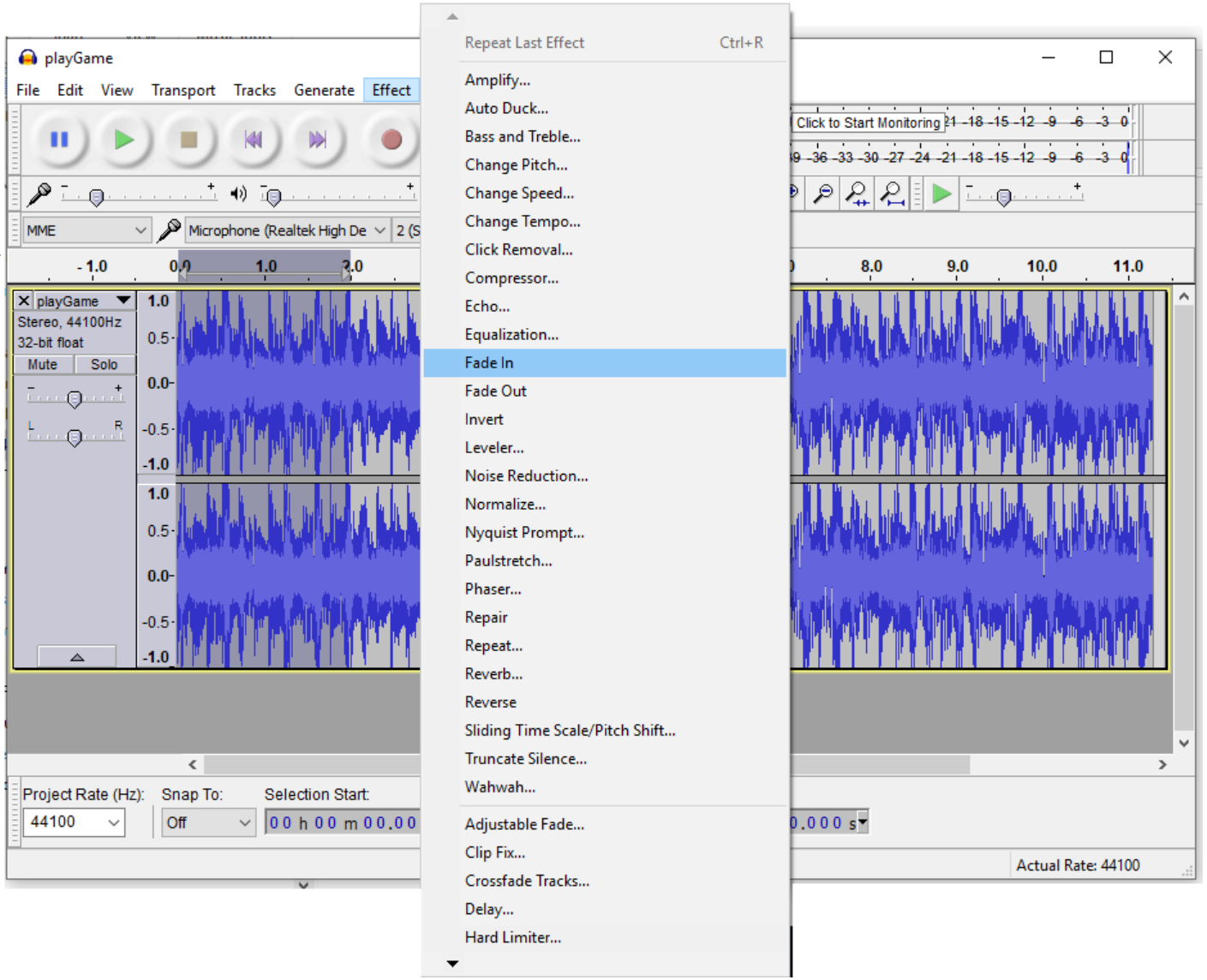


Figure 7a

Step 5: Fading in and out (cont.)

c) Select the last 2 seconds to fade out :
[Effect + Fade Out]

d) Export your file as
playGame_Faded.wav

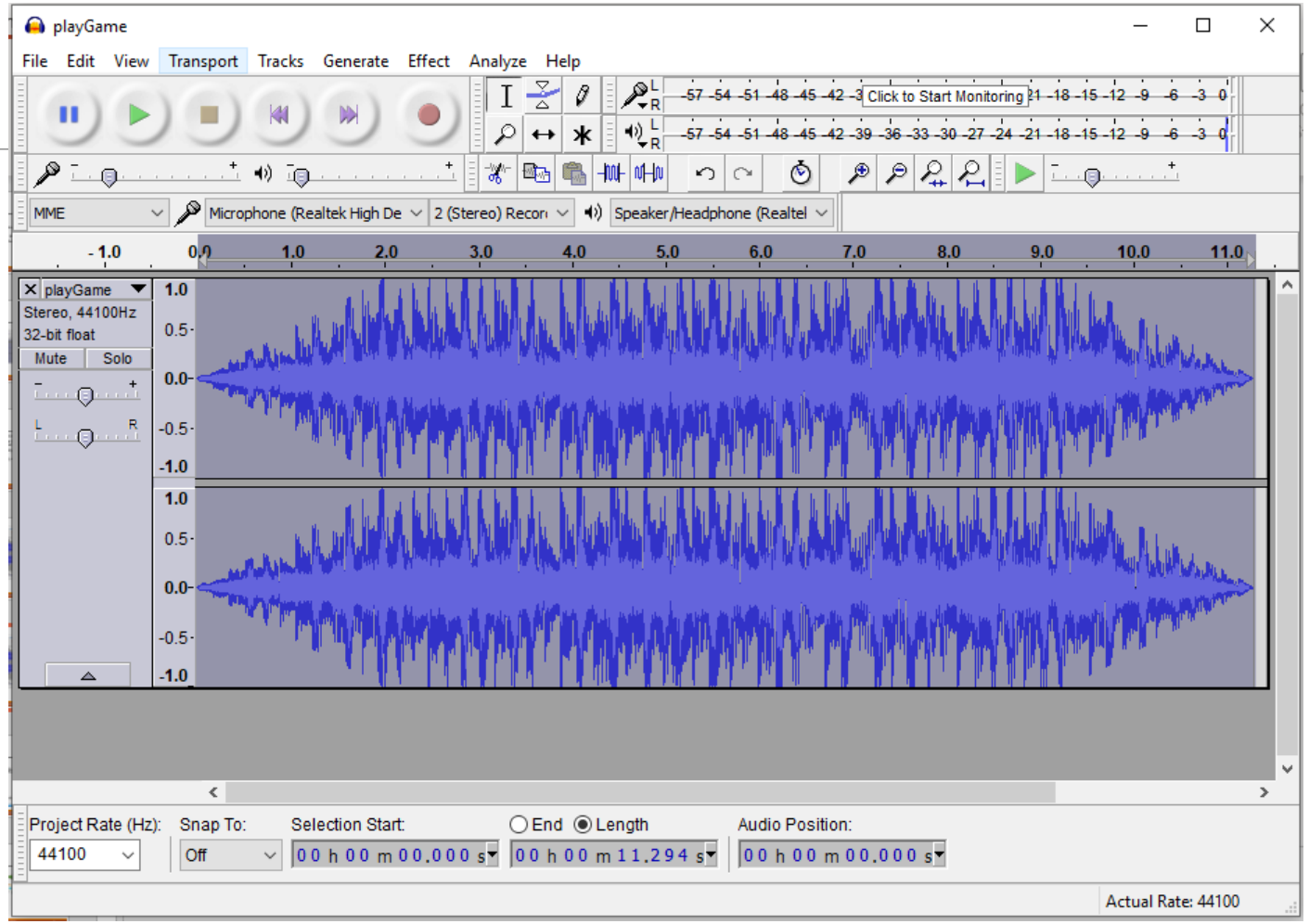


Figure 7b

Looping sounds

Video Game music start with an exciting intro that doesn't loop with the song.

This involves inserting a loop marker after the intro. Game music generally has these loop markers and audio players generally use them to loop automatically at the right position.

In audacity, we can create looping sounds and breakdown music as an:

- Intro music
- Looping music
- Outro or transition music

If you do, make sure you export to .wav or .ogg formats, since the .mp3 format often adds some blank at the beginning of the file.

https://www.youtube.com/watch?v=NTa6Xbzfq1U

Game music

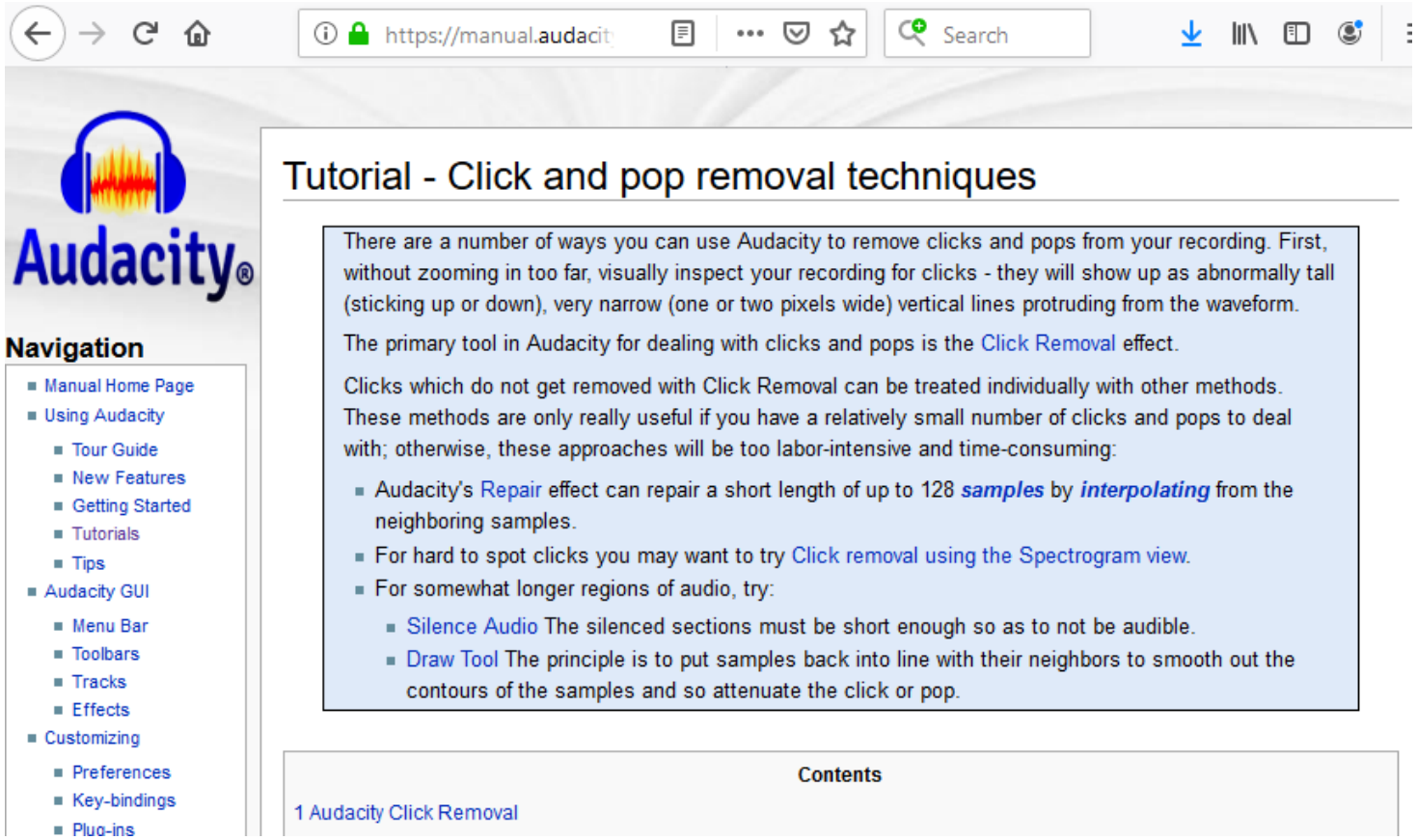
Multiple audio tracks are often layered on top of each other

- Game Music
- Speech
- Ambiance Track (wind, sea, forest, etc)

The volume of these tracks is adjusted according to the game's circumstances

For example, when there is conversations happening between game characters, the game lowers the music to emphasise on the conversation.

Audacity Tutorials



https://manual.audacityteam.org/man/tutorials.html

Questions

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