



# LIGN 110 Section 25202 Week 8

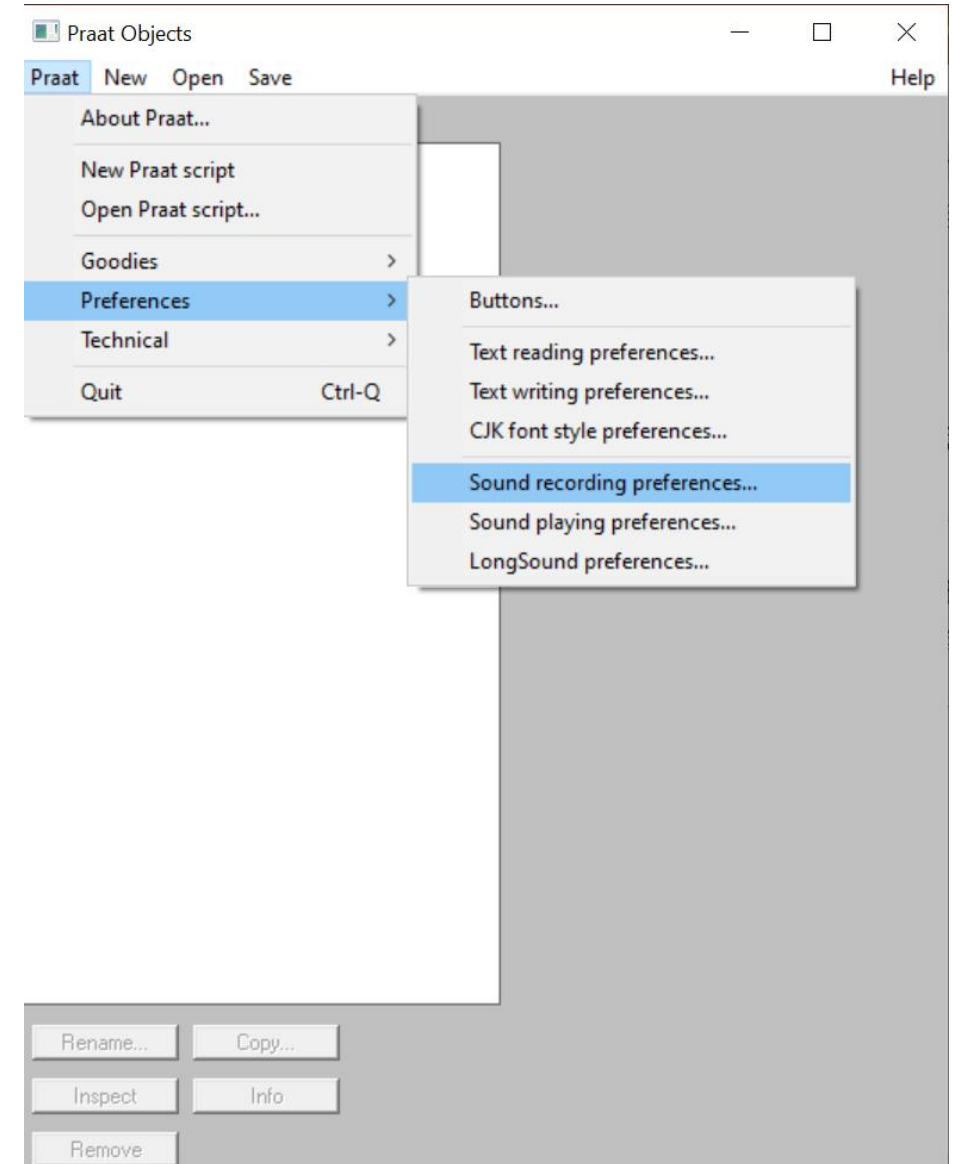
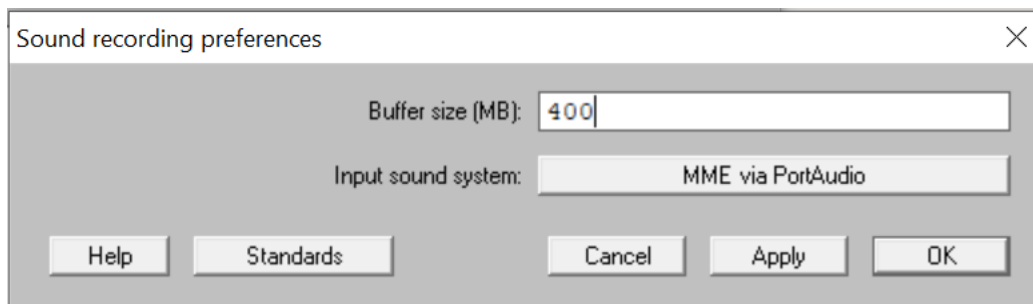
Yuan Chai  
11/23/2020

# Reminder

- Questions on lecture materials, quizzes, homework, final project?

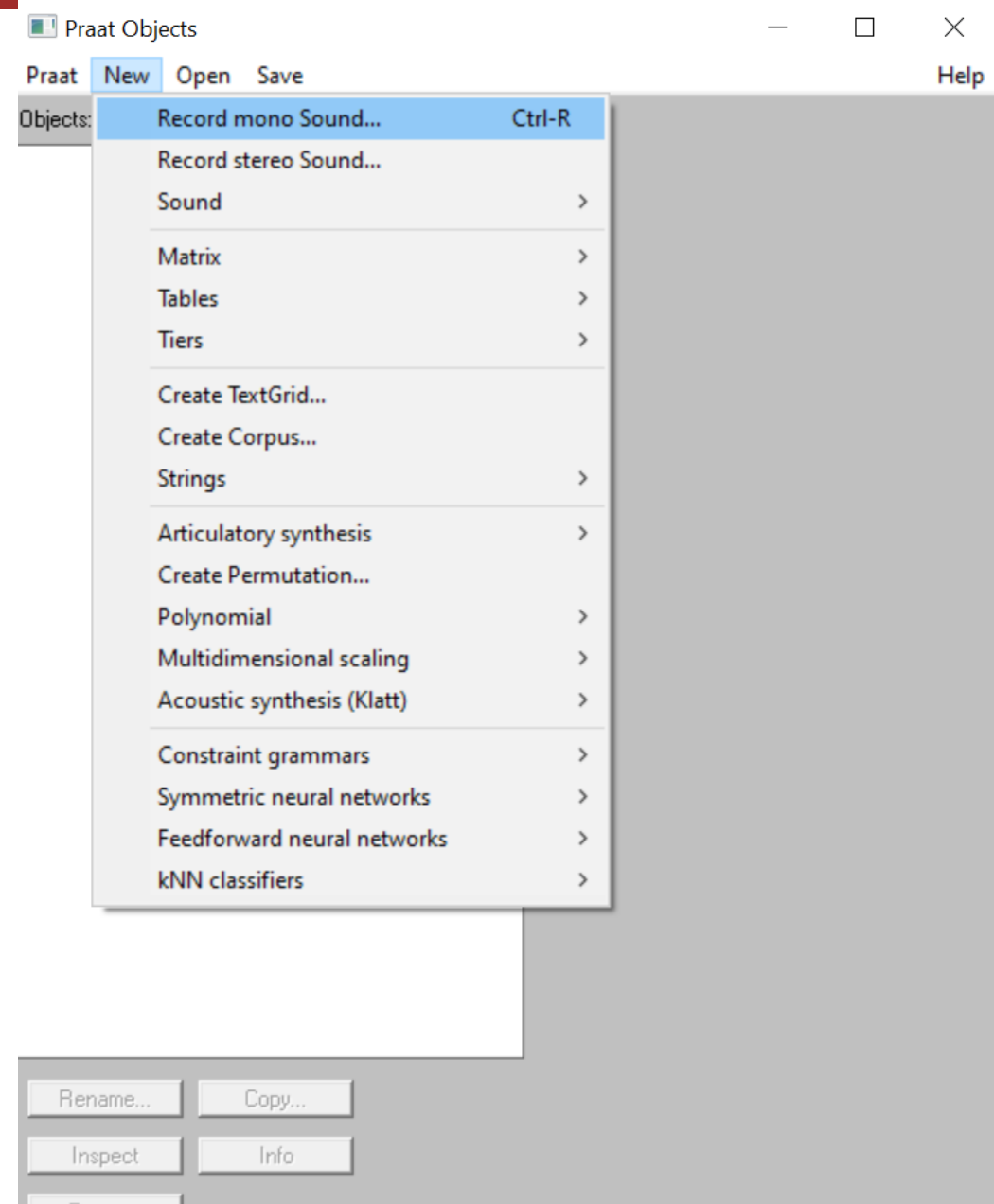
# How to record in Praat

- Record using Praat
- **STEP 1: Download and change preferences**
- Download Praat at <https://www.fon.hum.uva.nl/praat/>
- Open Praat → Preference → Sound recording preference → Buffer size: 400



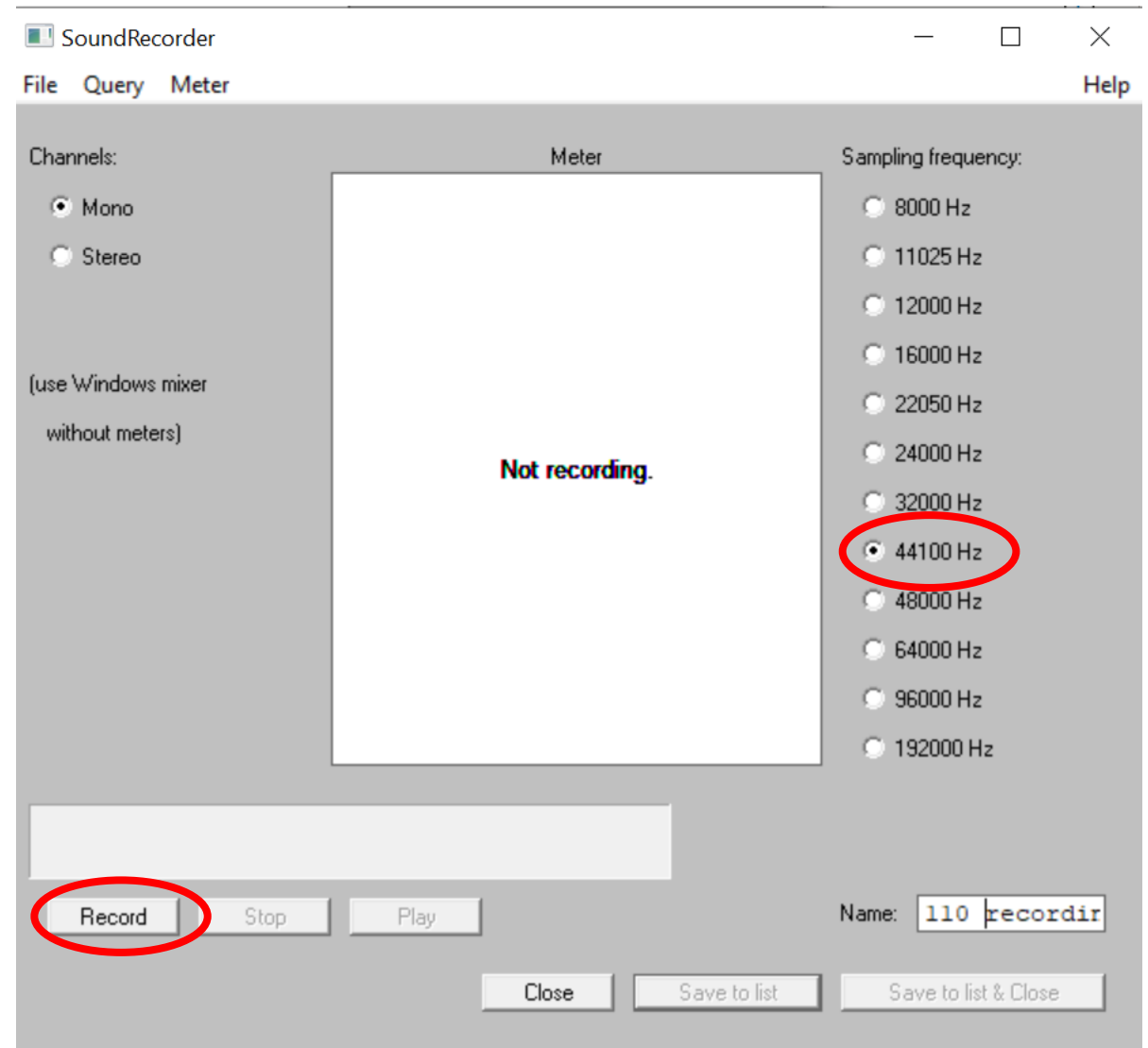
# How to record in Praat

- **Step 2: Make the recording**
- New → Record mono Sound



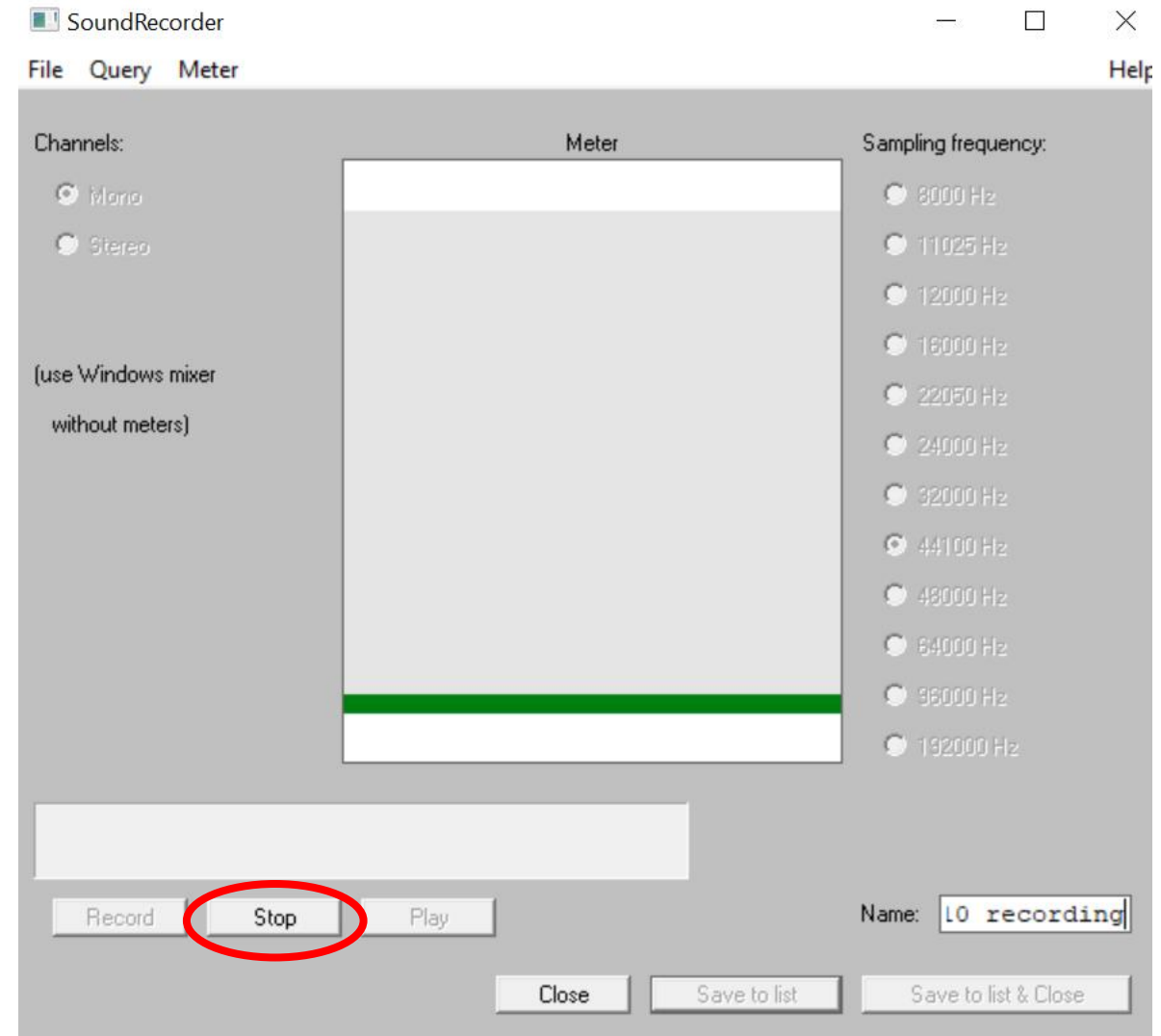
# How to record in Praat

- **Step 2: Make the recording**
- New → Record mono Sound
- Select 44100 Hz under Sampling frequency
- Click “Record” to start recording.



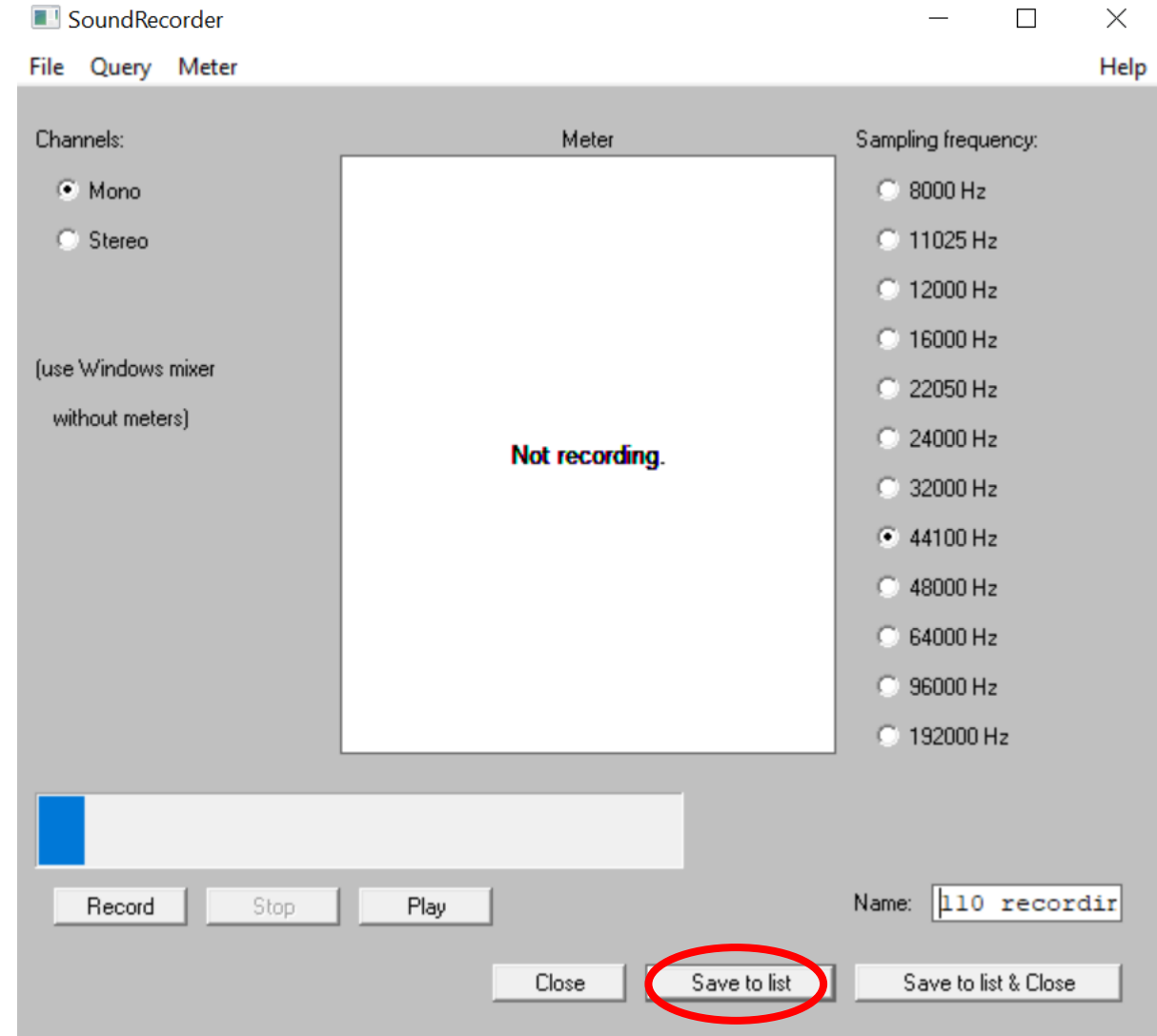
# How to record in Praat

- **Step 2: Make the recording**
- New → Record mono Sound
- Select 44100 Hz under Sampling frequency
- Click “Record” to start recording.
- Click “Stop” to stop recording.



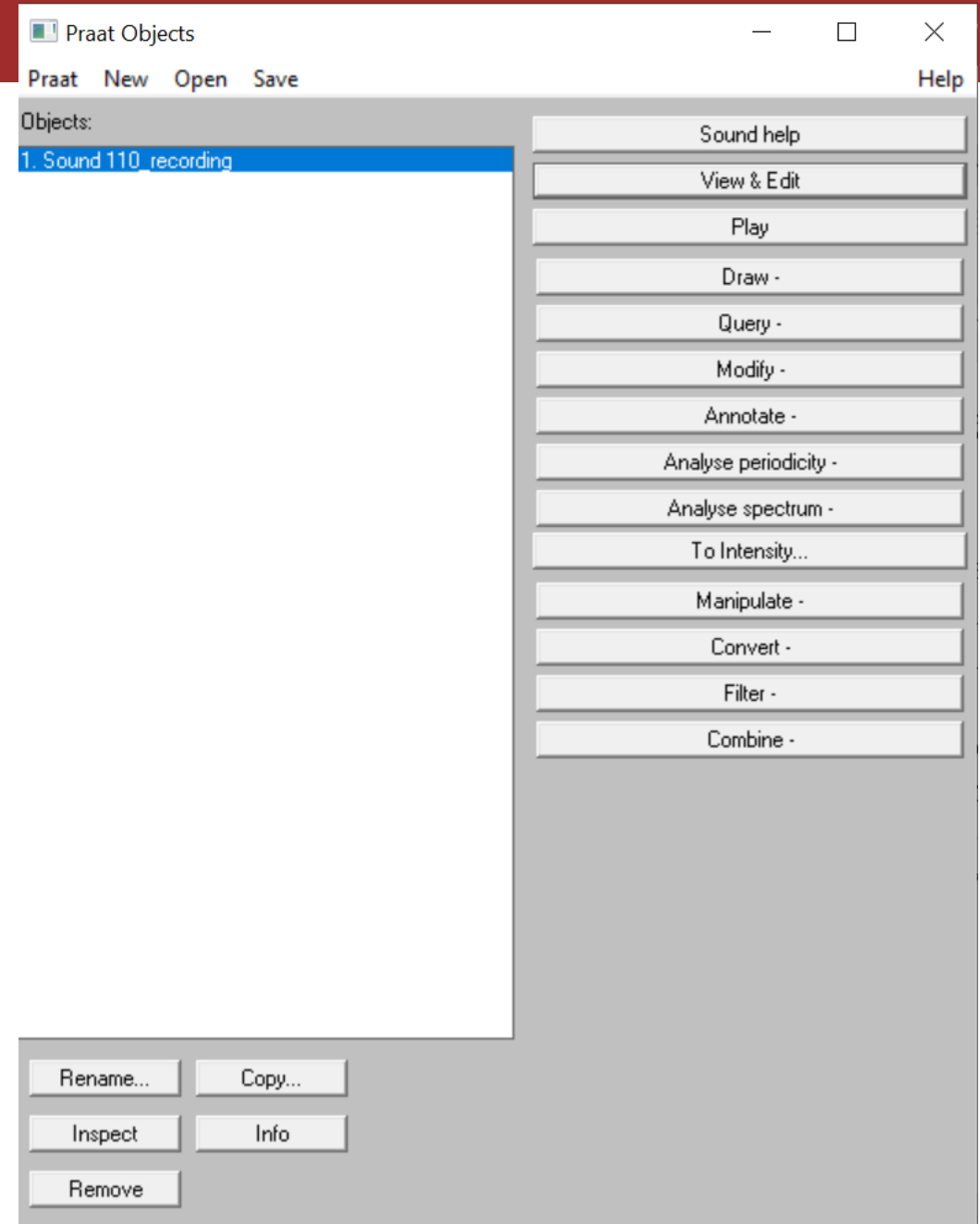
# How to record in Praat

- **Step 2: Make the recording**
- New → Record mono Sound
- Select 44100 Hz under Sampling frequency
- Click “Record” to start recording.
- Click “Stop” to stop recording.
- Give the recording a name, and click “Save to list”



# How to record in Praat

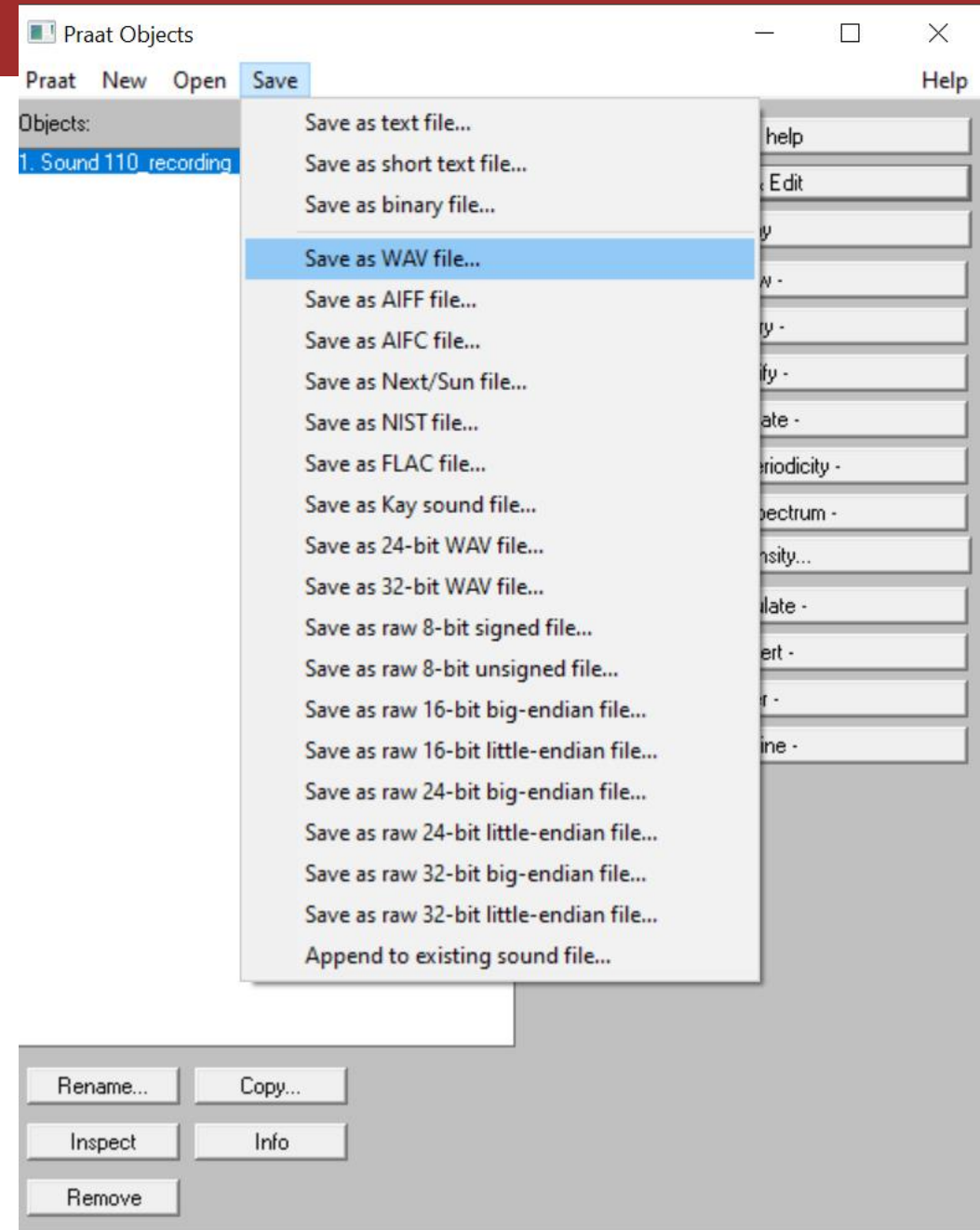
- **Step 3: Save the recording**
- In the main panel of Praat, select the sound file that you want to save.





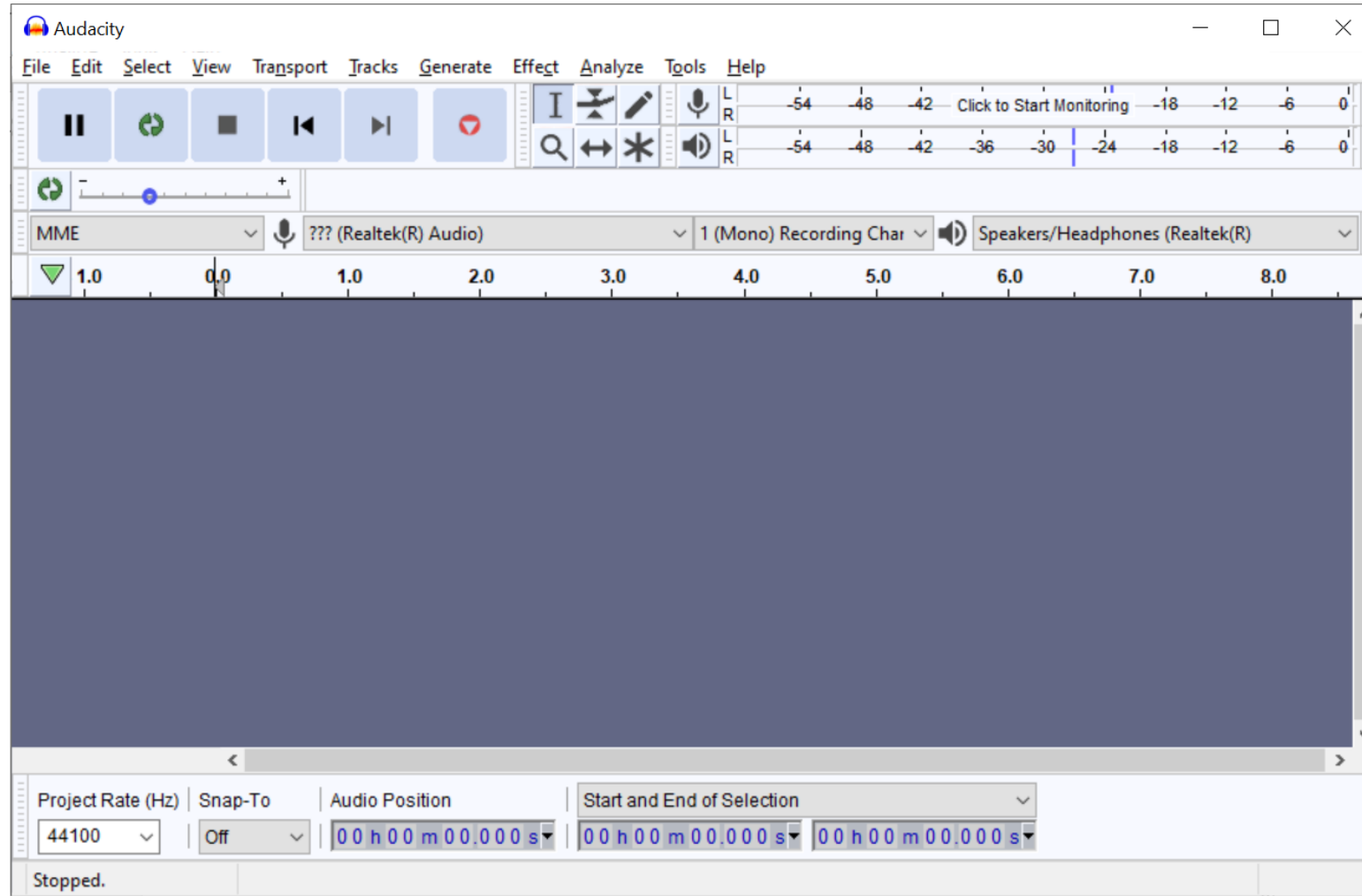
# How to record in Praat

- **Step 3: Save the recording**
- In the main panel of Praat, select the sound file that you want to save.
- Select “Save” → “Save as WAV file”
- Save the file in a folder



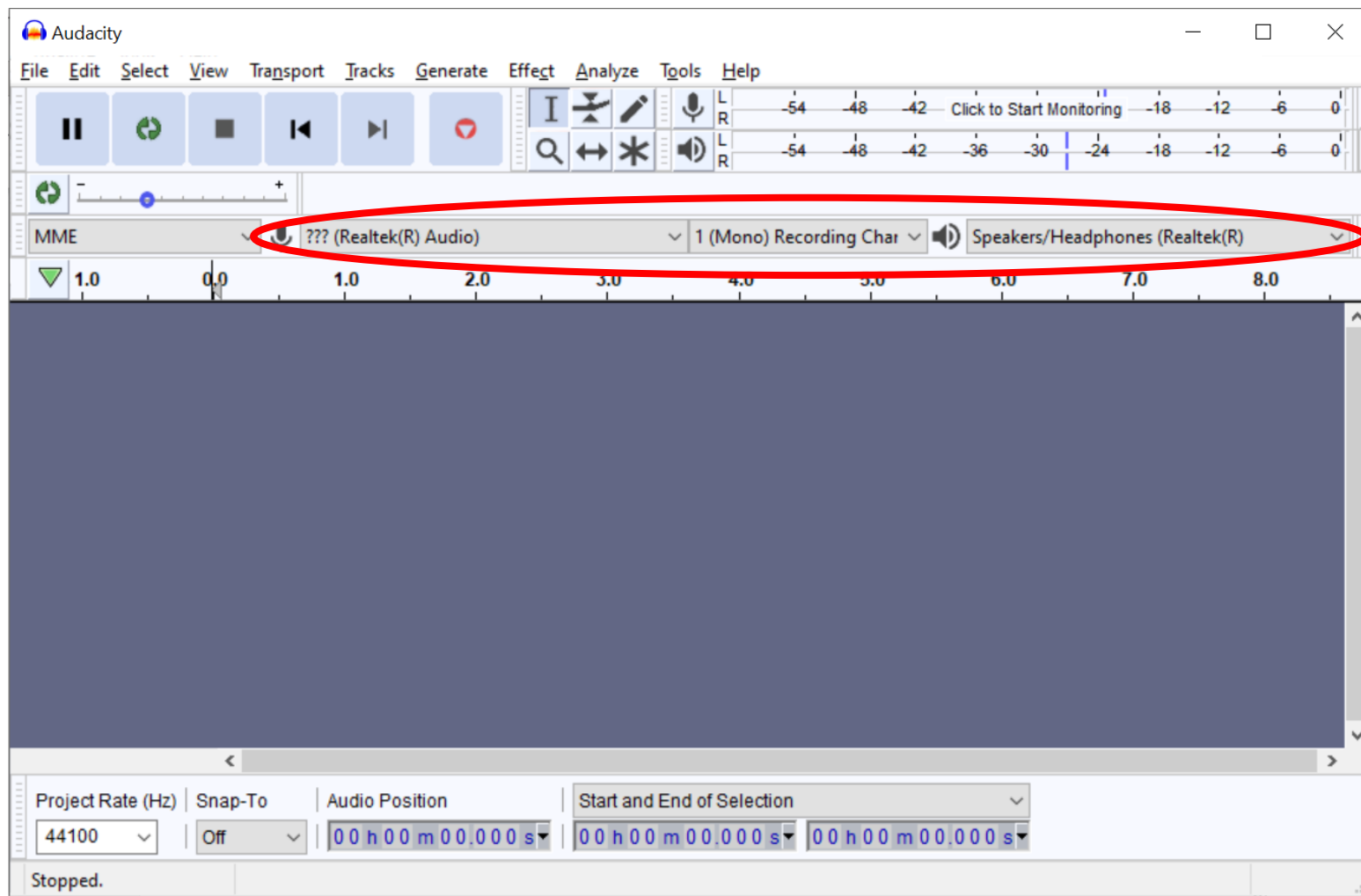
# How to record in Audacity

- **Step 1: Download Audacity**
- Download Audacity at <https://www.audacityteam.org/>
- Open Audacity



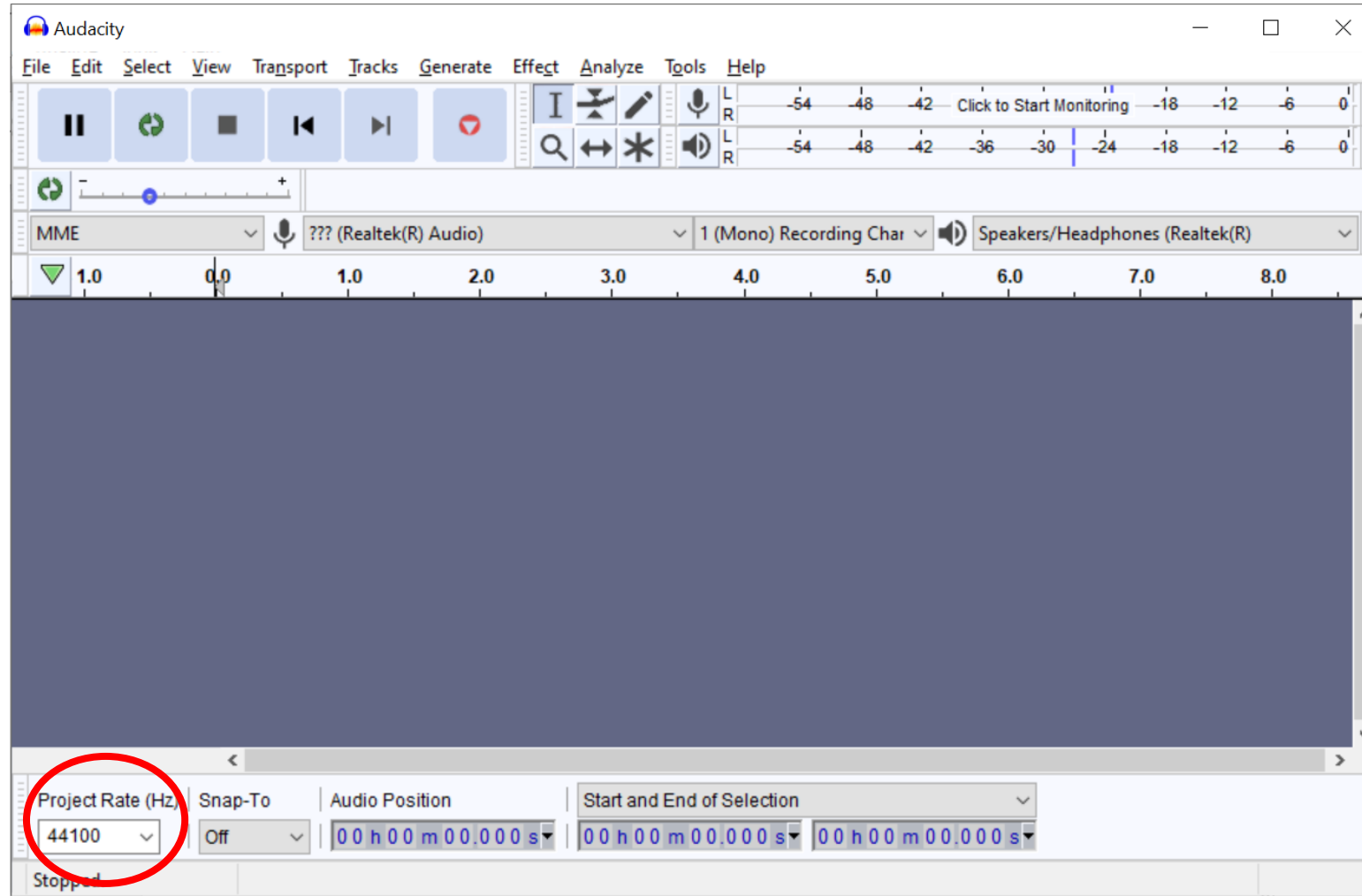
# How to record in Audacity

- **Step 2: Change settings**
- If you are recording using the built-in microphone, select the built-in sound card for the input and output; The default setting is usually correct;
- If using external microphone, select the device you plugged in.
- Select “**1 (Mono)** Recording Channel”
- Select “**1 (Mono)** Recording Channel”



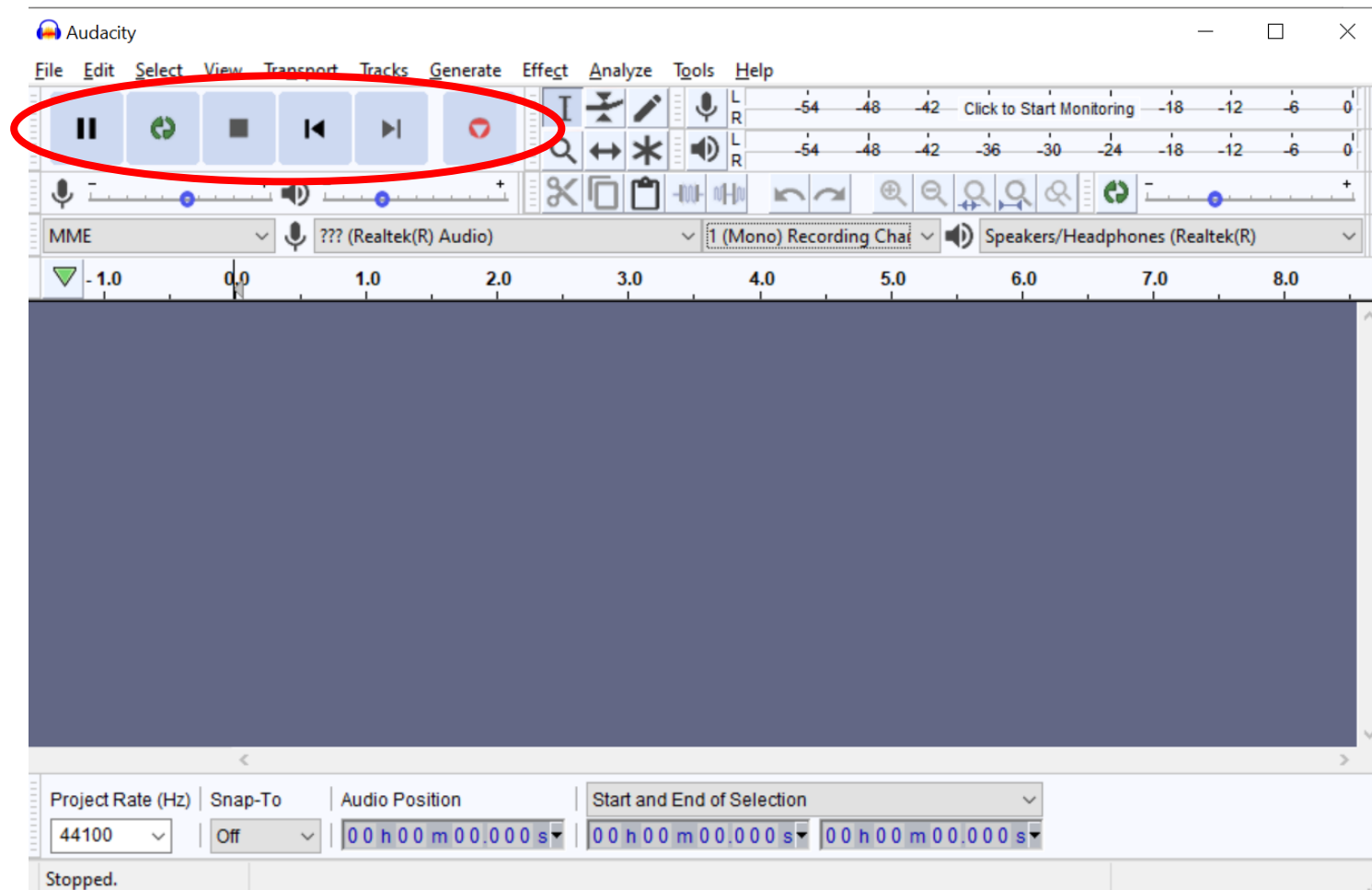
# How to record in Audacity

- **Step 2: Change settings**
- Select “Project Rate (Hz)” as 44100.



# How to record in Audacity

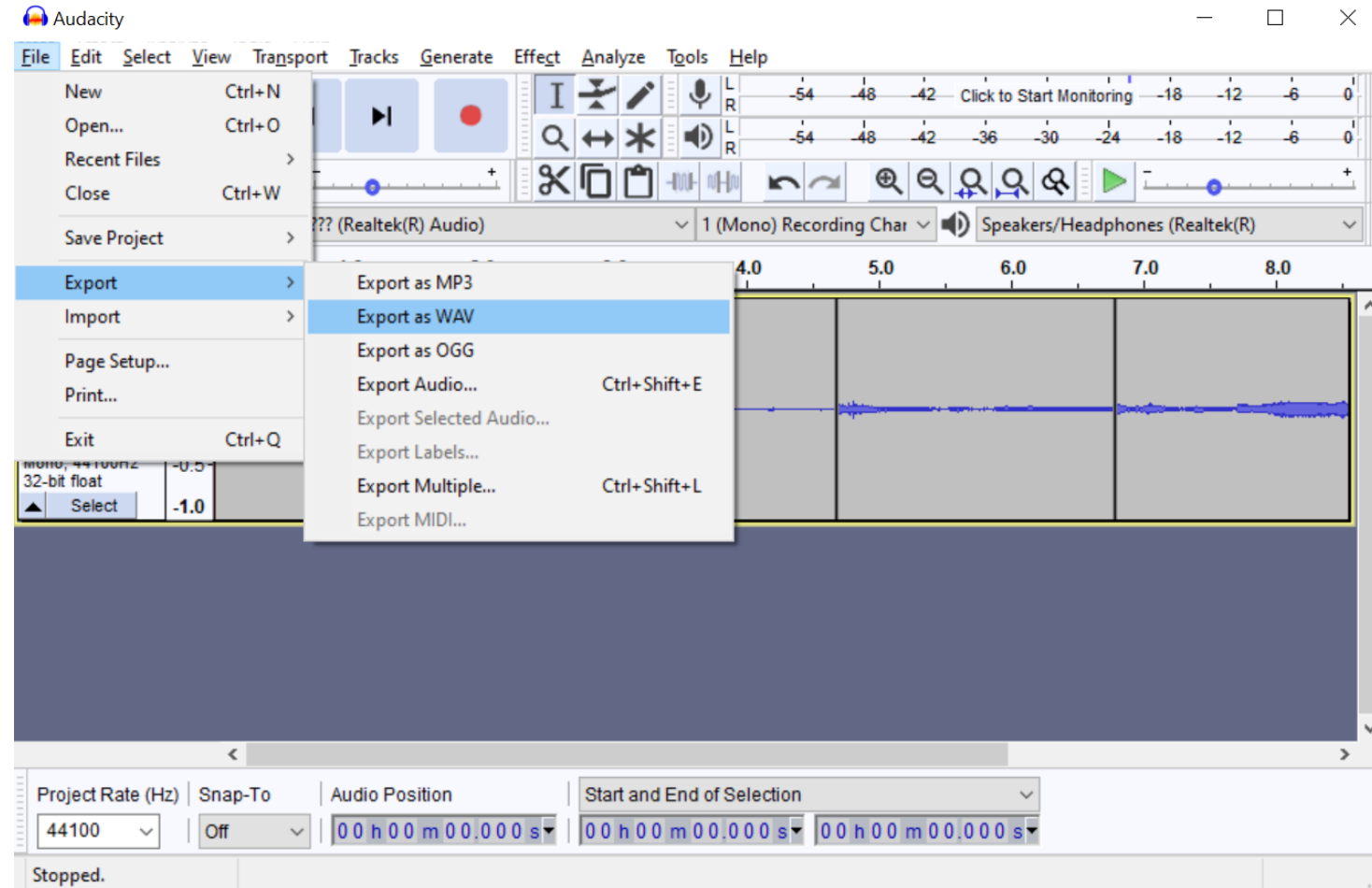
- **Step 3: Start recording**
- **Start:** select the round red (the last button from the right side)
- **Pause:** Select the first button to pause; click it again to unpause.
- **Stop:** If you have finished the recording, select the black square (third button from the left side) to stop the recording.



Buttons from left to right: pause; play; stop; select beginning; select end; record

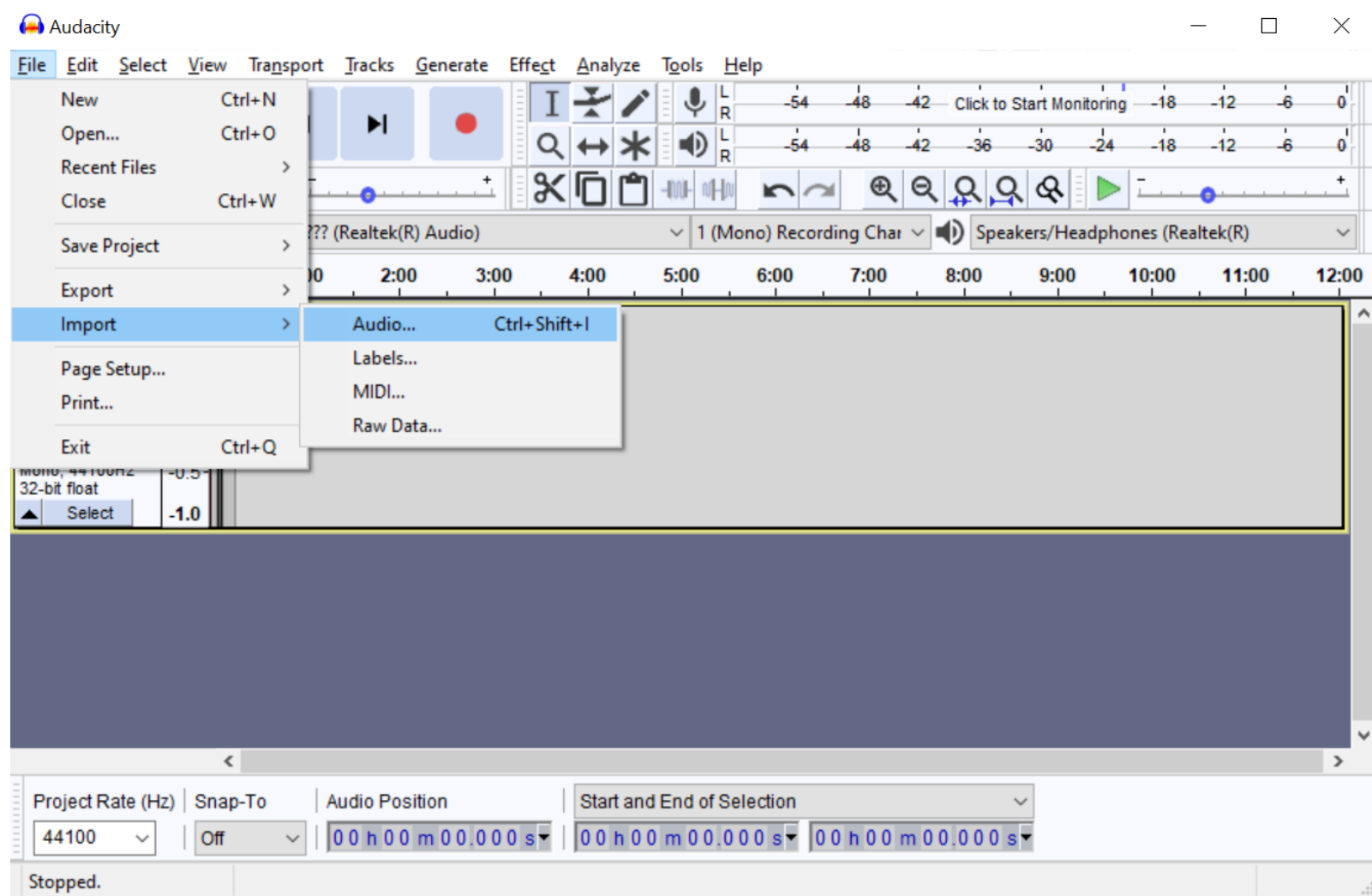
# How to record in Audacity

- **Step 4: Save the recording**
- Select “File” → “Export” → “Export as WAV”
- Save the file to a folder



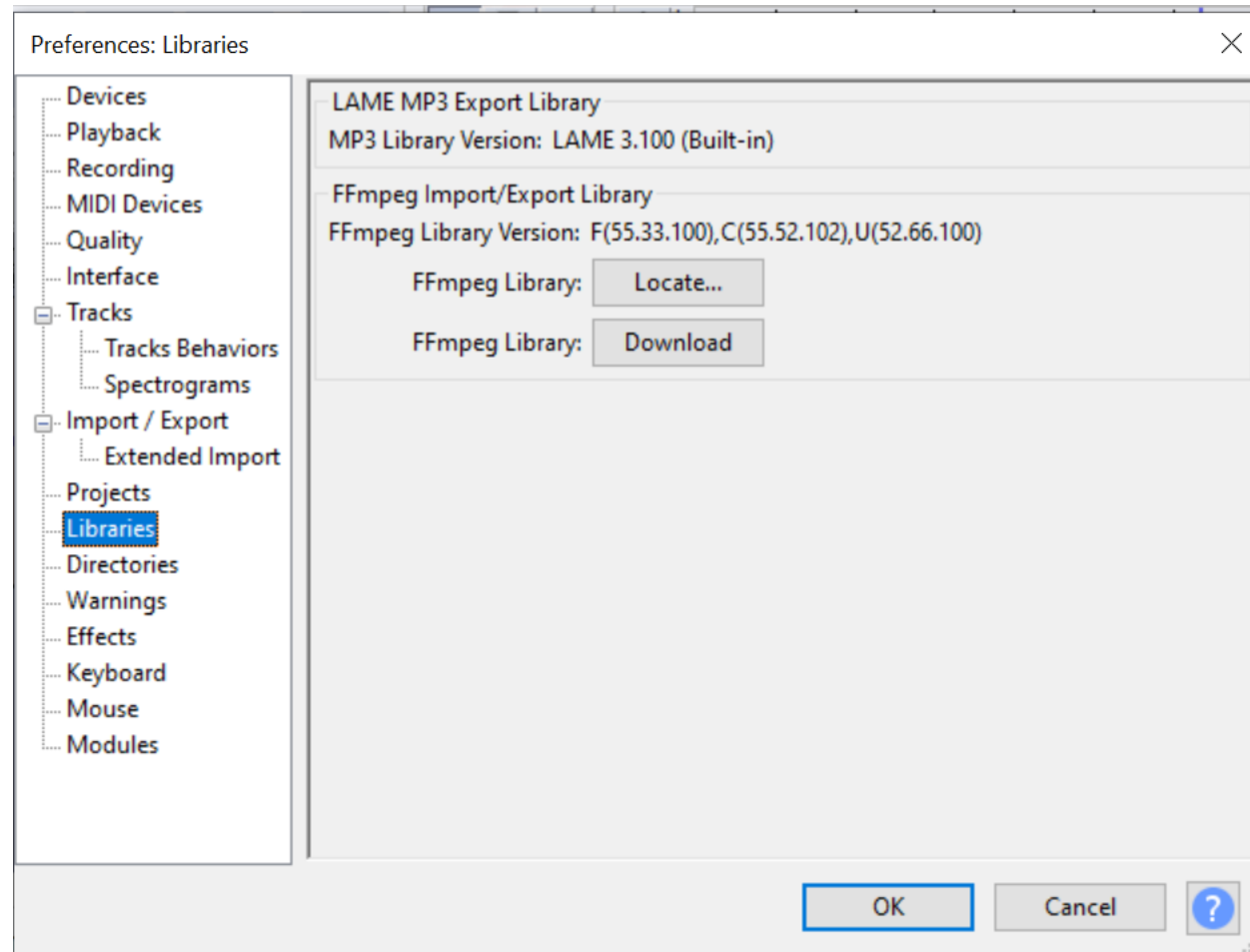
# How to record in Audacity

- **Note**
- Praat can only read .wav file and the audio file recorded using Zoom is .m4a format.
- You can import an .mp3 or .m4a sound file to Audacity and Export it as WAV.
- Select “File” → “Import” → “Audio” and locate the file you want to convert.



# How to record in Audacity

- **Note**
- When importing an .m4a or an .mp3 file, Audacity will ask you to locate the FFmpeg library. Please go to “Edit” → “Preferences” → “Libraries” → “FFmpeg Library Download”
- If you have difficulties download FFmpeg library, please email/talk to me.



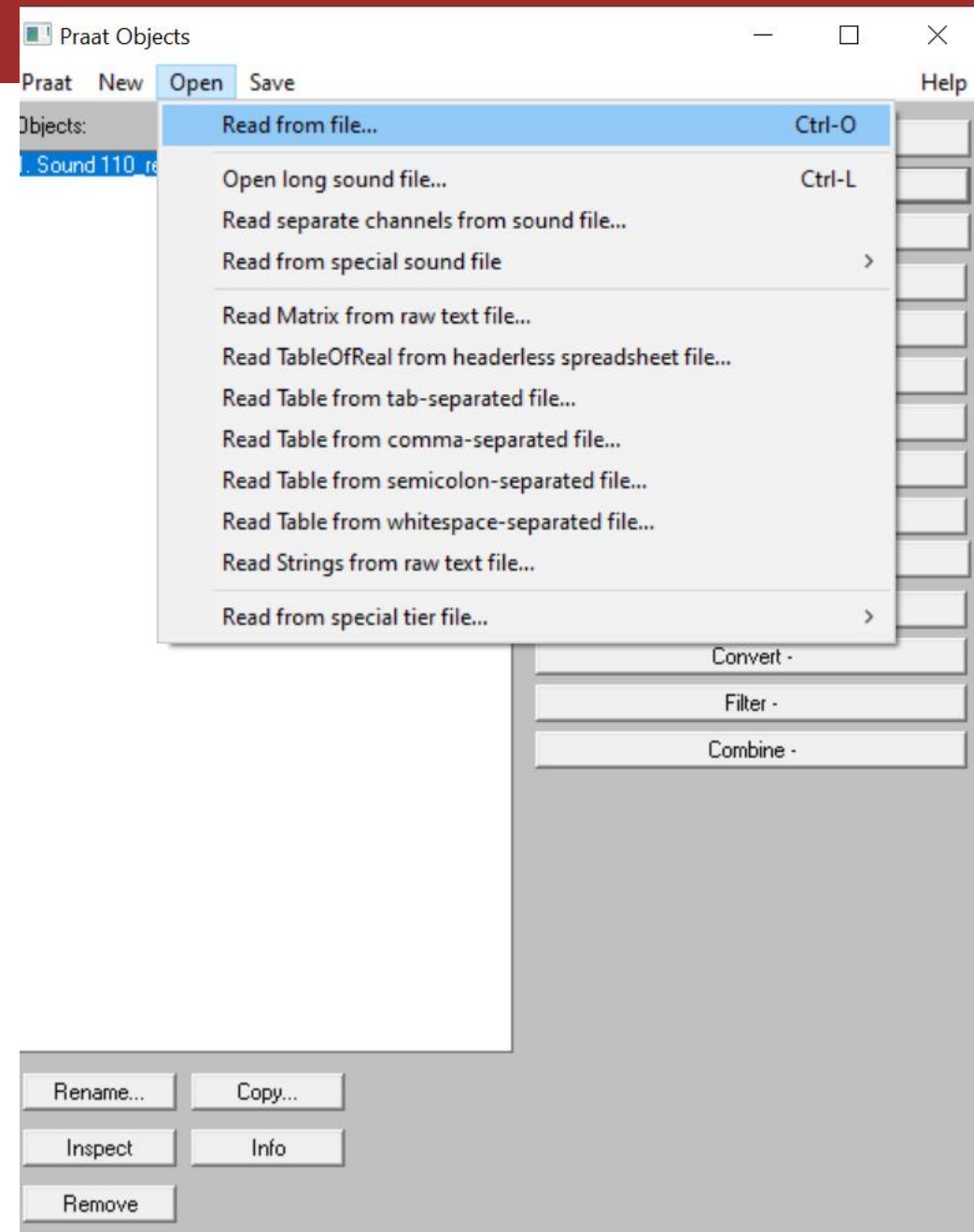


# Notes on recording

- The easiest way of recording remotely might be record on Zoom and upload the recording afterwards.
- If you would like to get better recording quality using recording devices like Praat and Audacity, you may have to record you and your separately and simultaneously.
- You will record yourself on Praat/Audacity on your end and your speaker will record themselves on Praat/Audacity on their end.
- One important thing is to **synchronize** the your and your speaker's recording. One way to do it is by you and your speaker clap **at the same time** at the beginning of the recording, and then use that clap as the landmark of synchrony.

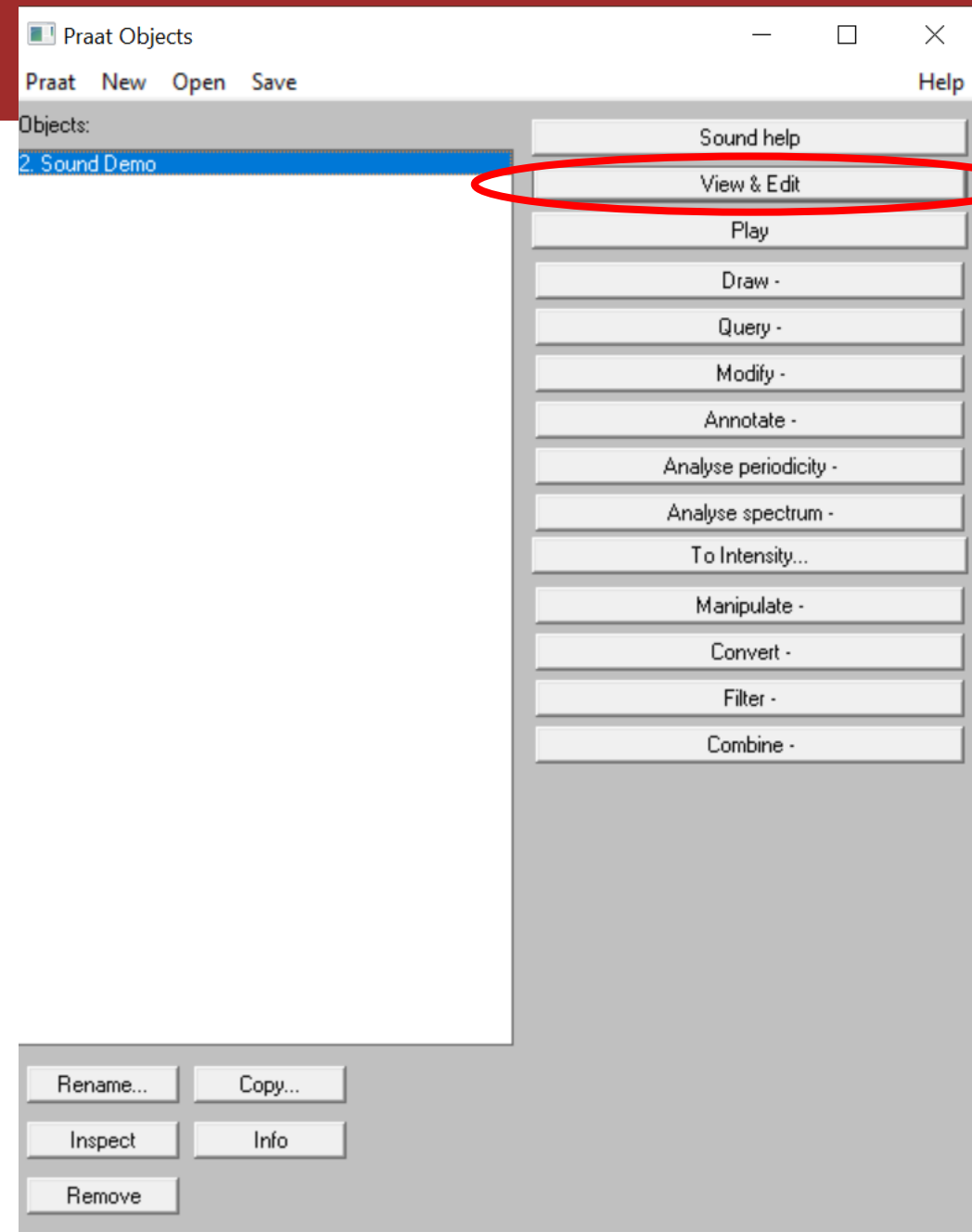
# Operating Praat

- Open a sound file: “Open” → “Read from file”



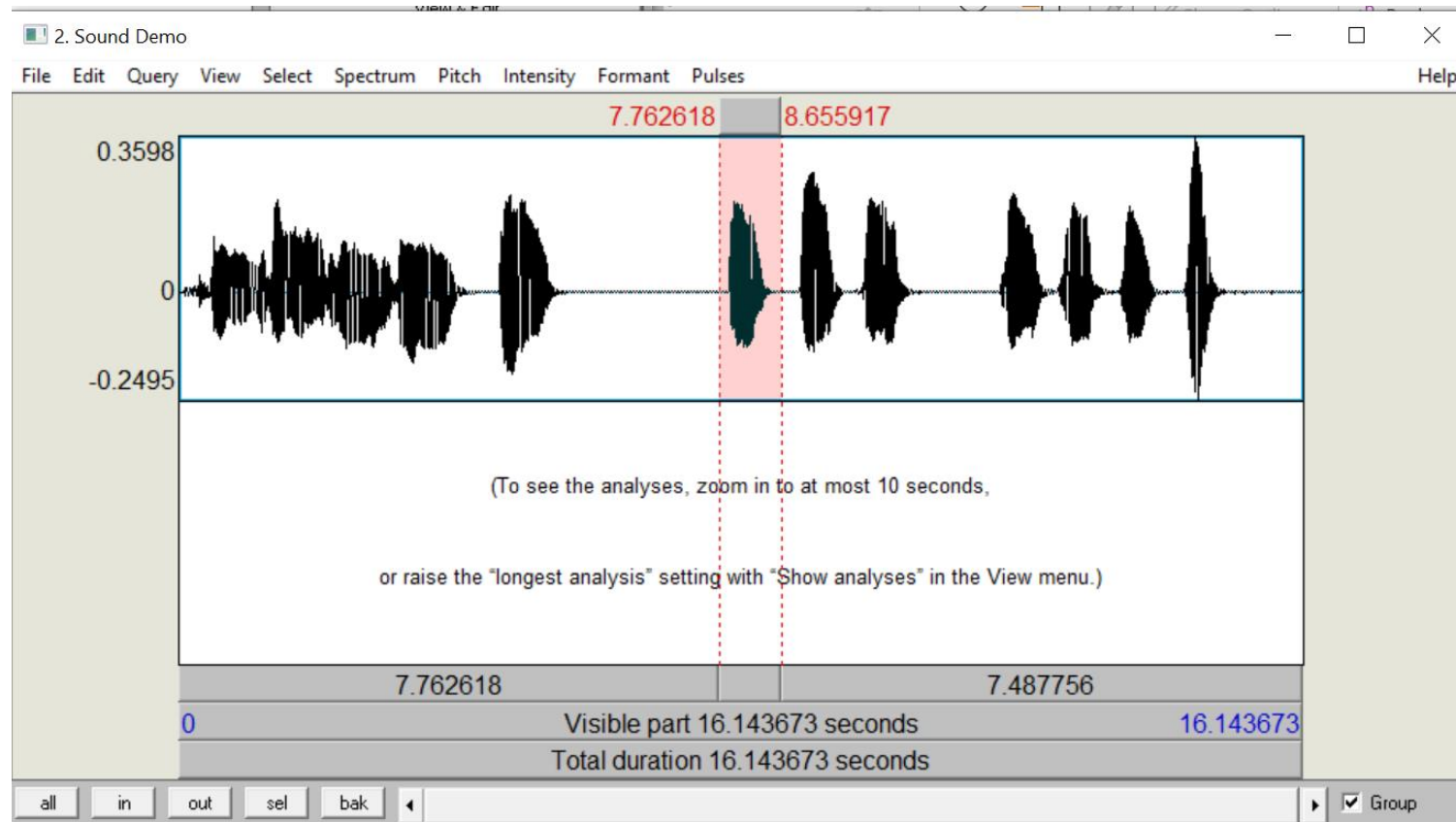
# Operating Praat

- **Open a sound file:**
- “Open” → “Read from file”
- Click on the file you want to open
- Select “View & Edit”



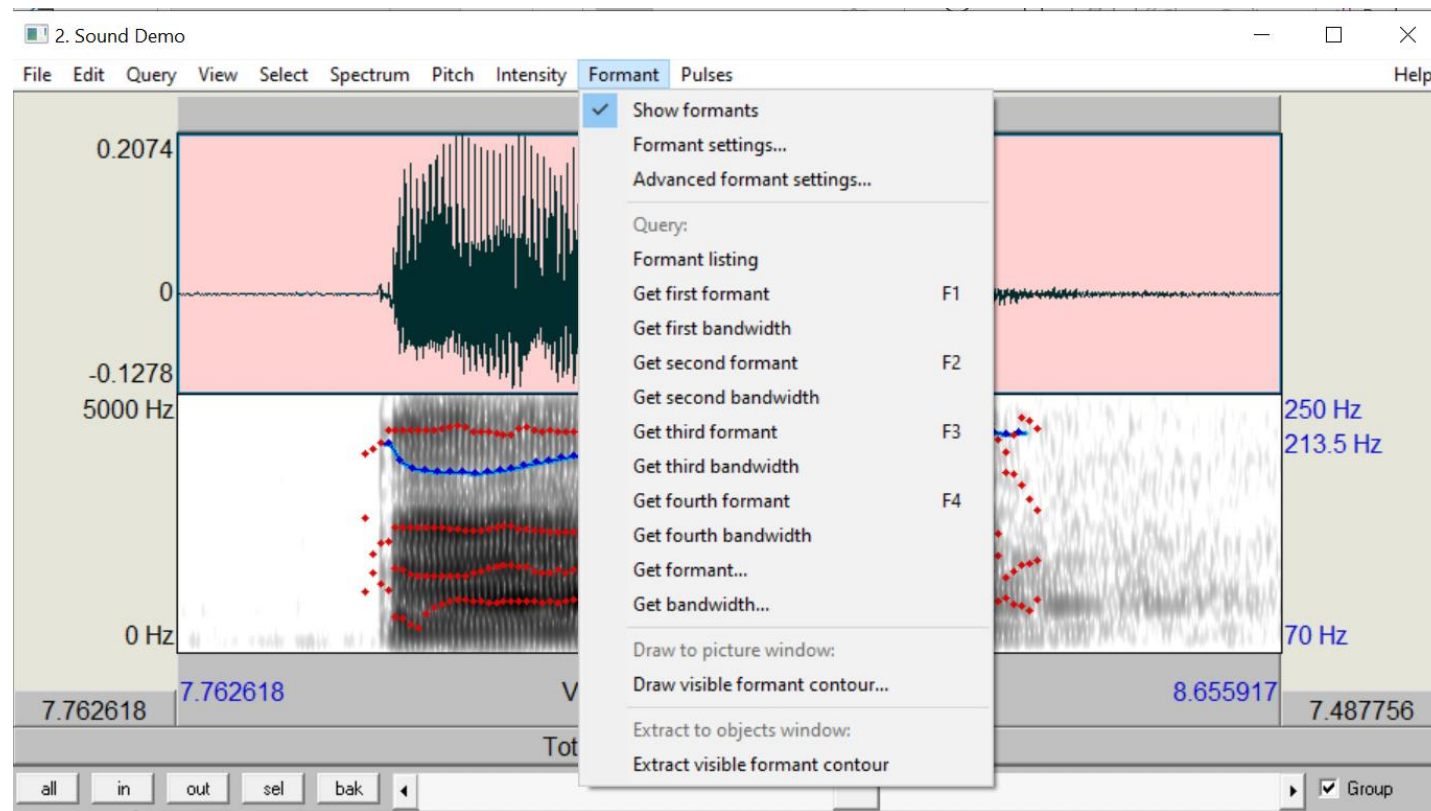
# Operating Praat

- **Navigate in Praat**
- Use your cursor to select an interval of sound that you want to listen to;
- Press “Tab” key on your keyboard to listen to it specifically;
- Ctrl/⌘ + I: Zoom in
- Ctrl/⌘ + O: Zoom out
- Ctrl/⌘ + N: Zoom to the selected interval



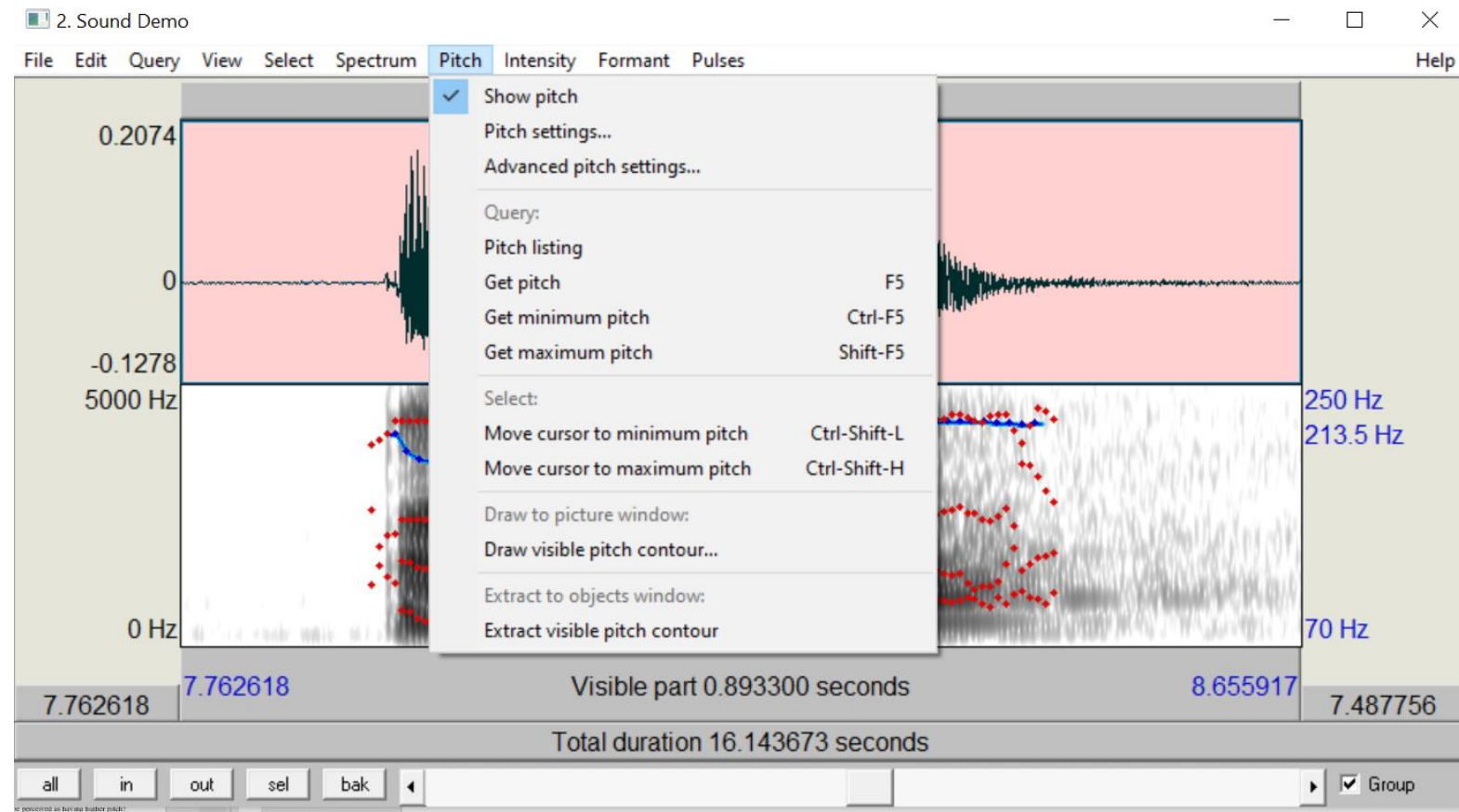
# Operating Praat

- **How to see Formants lines:**
- Select “Formants” → “Show formants”



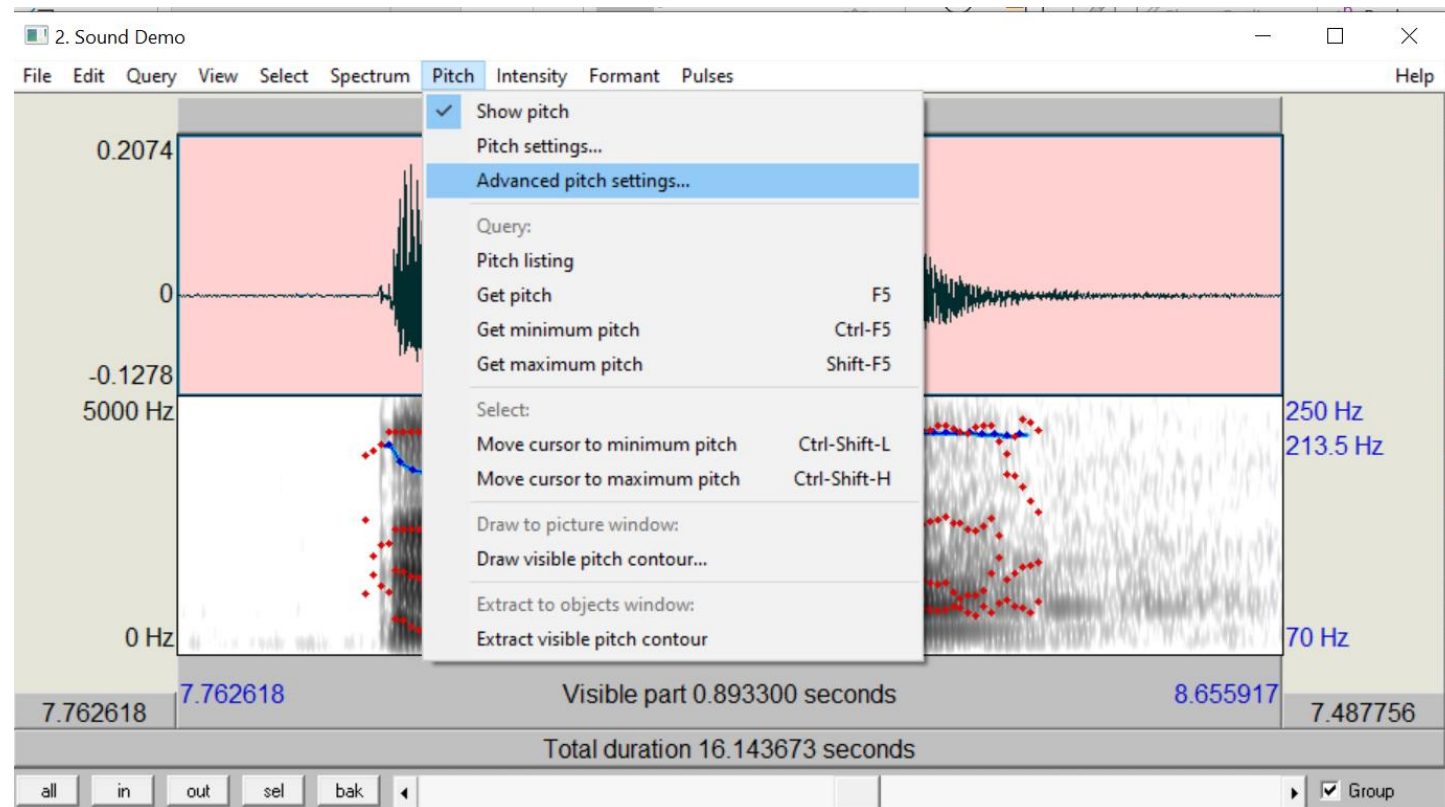
# Operating Praat

- **How to see Pitch lines:**
- Select “Pitch” → “Show pitch”



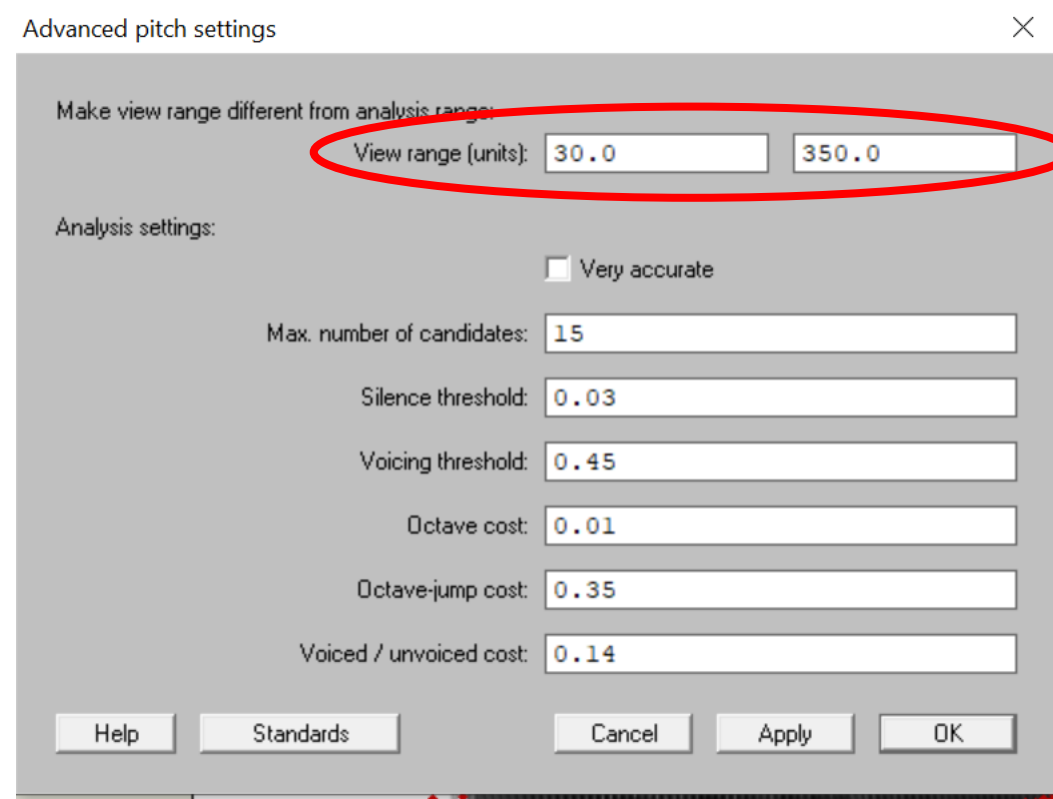
# Operating Praat

- **Pitch settings need to be adjusted:**
- “Pitch” → “Advanced pitch settings”



# Operating Praat

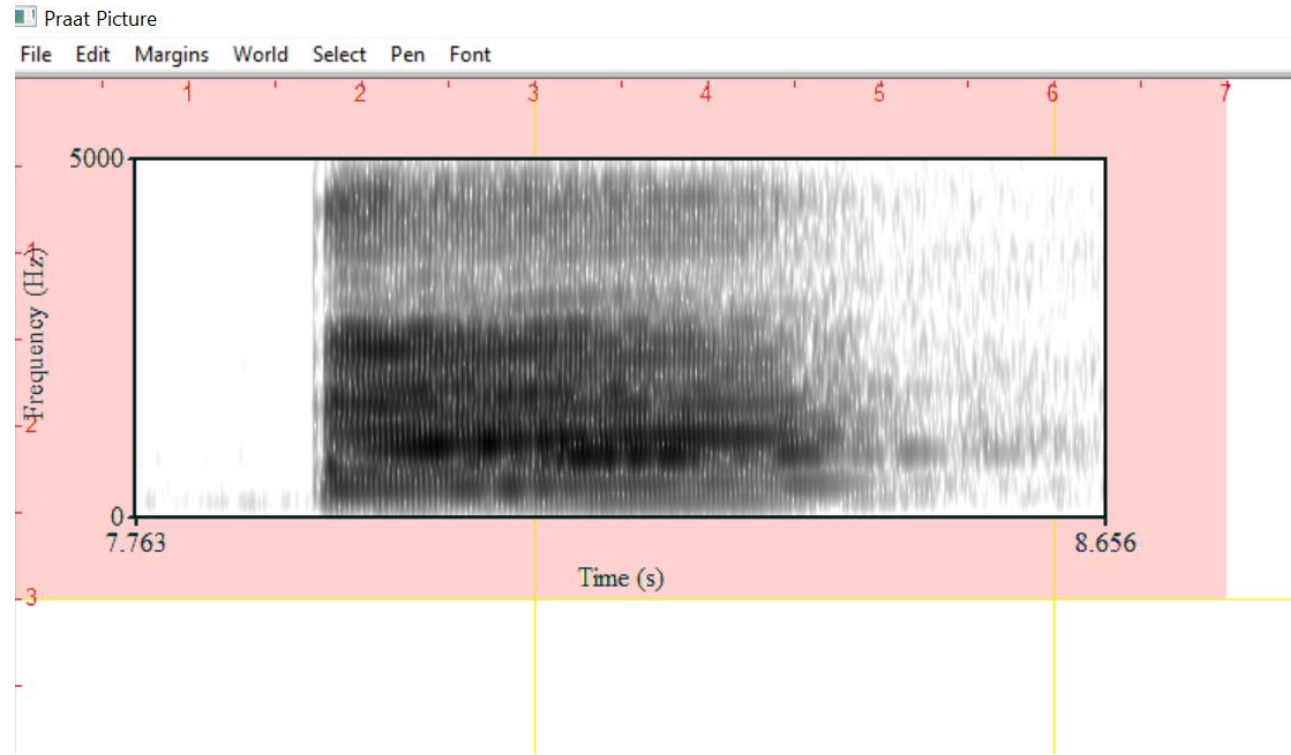
- **Pitch settings need to be adjusted:**
- “Pitch” → “Pitch settings”
- Adjust the **View range** of pitch:
  - Male: typically 30-350
  - Female: typically 50-450





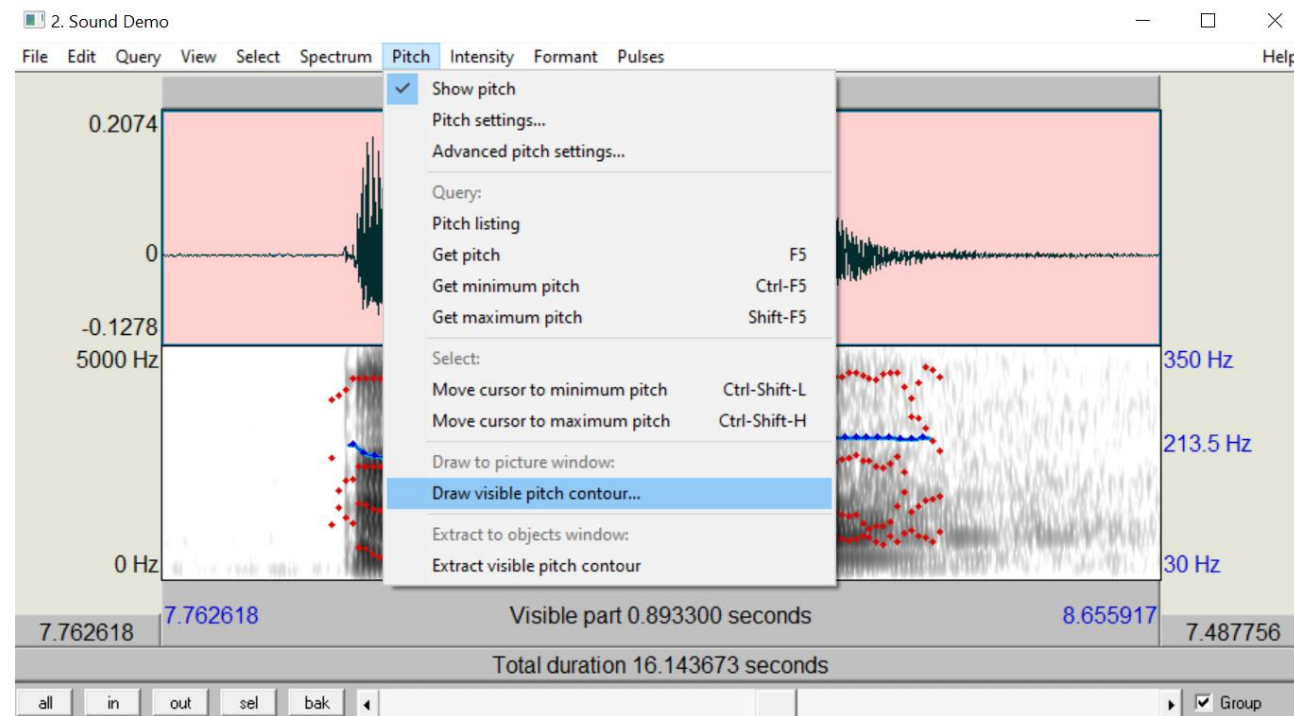
# Operating Praat

- **Draw spectrogram**
- You can zoom in (ctrl + N) to the selected interval and take a **screenshot** of the spectrogram;
- **OR (for better presentation):**
- Go to “Spectrum” → “Paint visible spectrogram”
- The spectrogram will show in Praat Picture.
- You can adjust the area that you want to draw the spectrogram in Praat Picture.



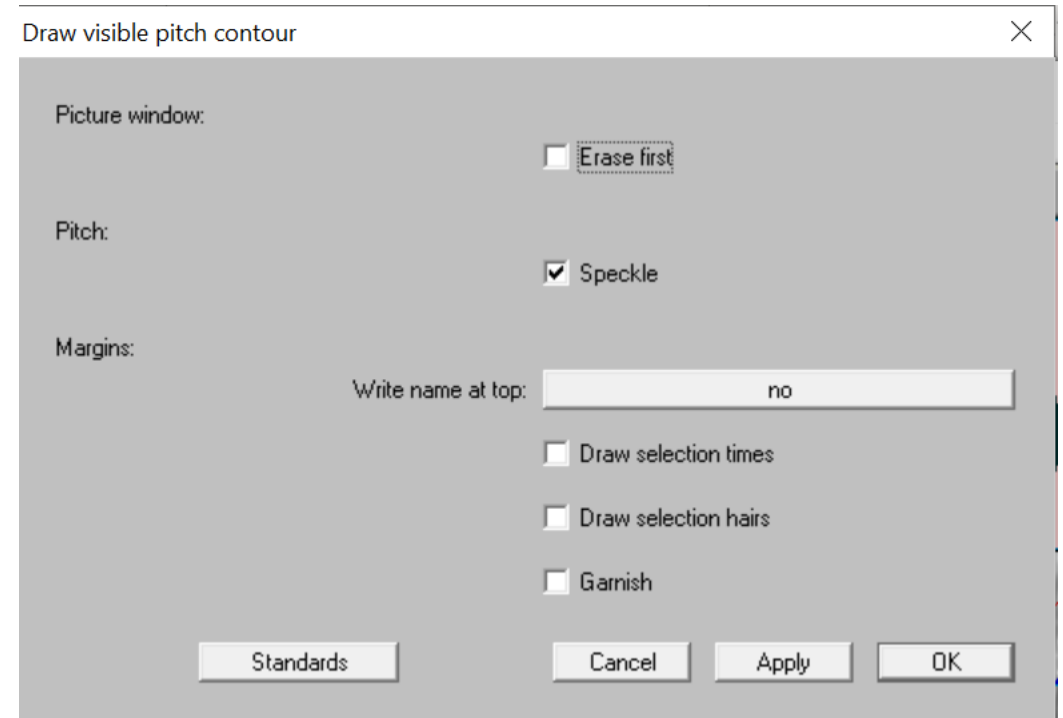
# Operating Praat

- **Draw spectrogram**
- You can also add pitch contour on top of the spectrogram by “Pitch”  
→ “Draw visible pitch contour”



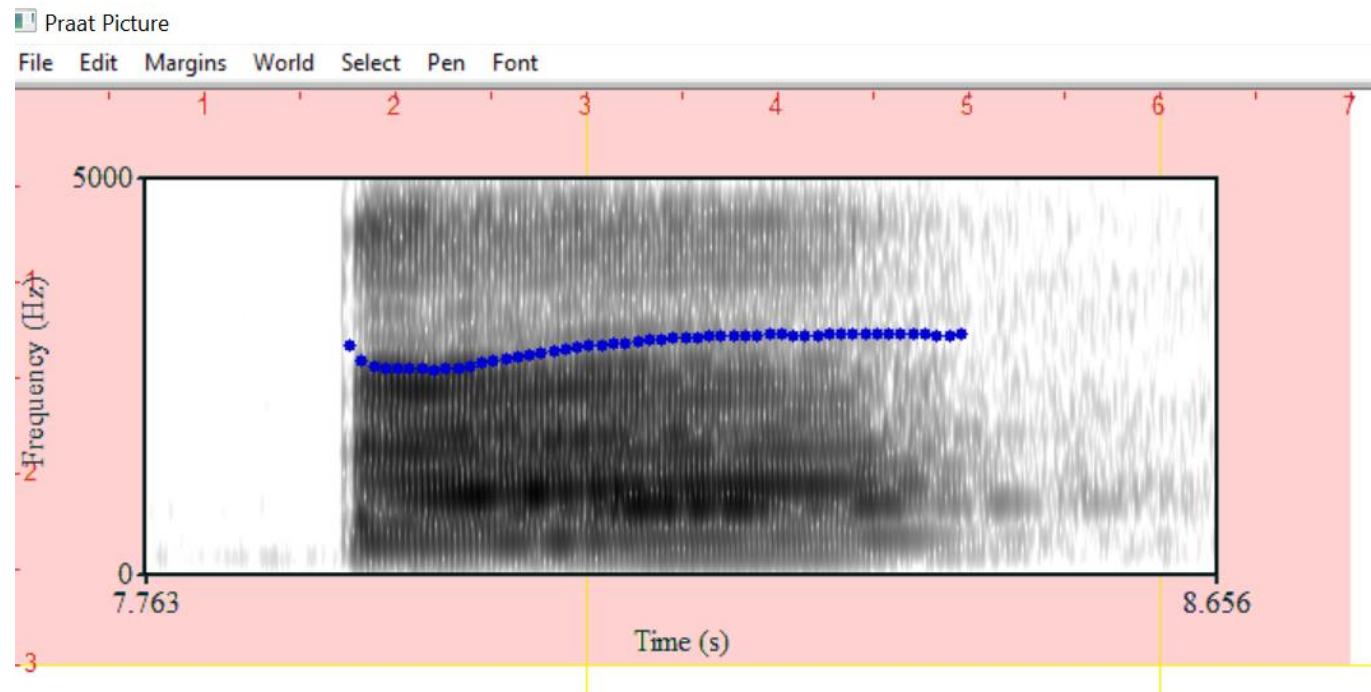
# Operating Praat

- **Draw pitch**
- You can also add pitch contour on top of the spectrogram by “Pitch”  
→ “Draw visible pitch contour”
- **Unselect** “Erase first” (otherwise the existing picture on the panel will be erased!).
- You can choose either “Speckle” or not. Speckle means that the pitch track will be in dots.



# Operating Praat

- **Draw pitch**
- This is what the pitch overlays on spectrogram looks like.
- You can change the color of the pitch track, the size of the speckle, or the width of line under “**Pen**”



# Operating Praat

- **Reference for English vowel formants (attached in email and can be found on my website.)**
- Hillenbrand, J., Getty, L. A., Clark, M. J., & Wheeler, K. (1995). Acoustic characteristics of American English vowels. *The Journal of the Acoustical society of America*, 97(5), 3099-3111.

TABLE V. Average durations, fundamental frequencies, and formant frequencies of vowels produced by 45 men, 48 women, and 46 children. Averages are based on a subset of the tokens that were well identified by listeners (see text for details). The duration measurements are in ms; all others are in Hz.

		/i/	/ɪ/	/e/	/ɛ/	/æ/	/ɑ/	/ɔ/	/o/	/u/	/ʊ/	/ʌ/	/ɜ/
Dur	M	243	192	267	189	278	267	283	265	192	237	188	263
	W	306	237	320	254	332	323	353	326	249	303	226	321
	C	297	248	314	235	322	311	319	310	247	278	234	307
F0	M	138	135	129	127	123	123	121	129	133	143	133	130
	W	227	224	219	214	215	215	210	217	230	235	218	217
	C	246	241	237	230	228	229	225	236	243	249	236	237
F1	M	342	427	476	580	588	768	652	497	469	378	623	474
	W	437	483	536	731	669	936	781	555	519	459	753	523
	C	452	511	564	749	717	1002	803	597	568	494	749	586
F2	M	2322	2034	2089	1799	1952	1333	997	910	1122	997	1200	1379
	W	2761	2365	2530	2058	2349	1551	1136	1035	1225	1105	1426	1588
	C	3081	2552	2656	2267	2501	1688	1210	1137	1490	1345	1546	1719
F3	M	3000	2684	2691	2605	2601	2522	2538	2459	2434	2343	2550	1710
	W	3372	3053	3047	2979	2972	2815	2824	2828	2827	2735	2933	1929
	C	3702	3403	3323	3310	3289	2950	2982	2987	3072	2988	3145	2143
F4	M	3657	3618	3649	3677	3624	3687	3486	3384	3400	3357	3557	3334
	W	4352	4334	4319	4294	4290	4299	3923	3927	4052	4115	4092	3914
	C	4572	4575	4422	4671	4409	4307	3919	4167	4328	4276	4320	3788

# Exercise

1. Open the sound file collection sent in the email or on the website in Praat.
2. Concatenate the three sound files together.
3. Open the concatenated sound file in “View & Edit”
4. Press “Tab” on the keyboard to listen to the sound file.
5. Select the recording for “code” and play it.
6. Select the vowel portion and tell what the duration of the vowel is.
7. What are the F1, F2, and F3 of the vowel?
8. What is the F0 of the vowel?