EECS2311: SOFTWARE DEVELOPMENT PROJECT

User Manual: MusicXML Player and Viewer

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1. About TAB2XML

Intended Use

TAB2XML is a program to convert musical text-based tablatures into a readable music sheet. The music sheet can be adjusted and played, and exported as a PDF.

Features of the Product

TAB2XML currently focuses and is designed for guitar and drum text-based tablatures.

It has following the features:

- Converts text-based tablature into an XML file
- Converts text-based tablature into sheet music
- Allows editing of the generated sheet music
- Plays the text-based tablature as music

2. System Requirements

Operating System	Windows, MacOS
Disk Space	40 MB
RAM	256 MB
Java Version	java-17

3. Installation Instructions

Steps to getting the software on your computer are as follows:

1. Ensure you have java-17 installed on your computer. If you do not, please visit the following link for instructions on how to get java-17: https://www.oracle.com/java/technologies/downloads/

2. Access the link below, and download the newest release of the software from the GitHub repository. https://github.com/CCSCovenant/TAB2XML/releases

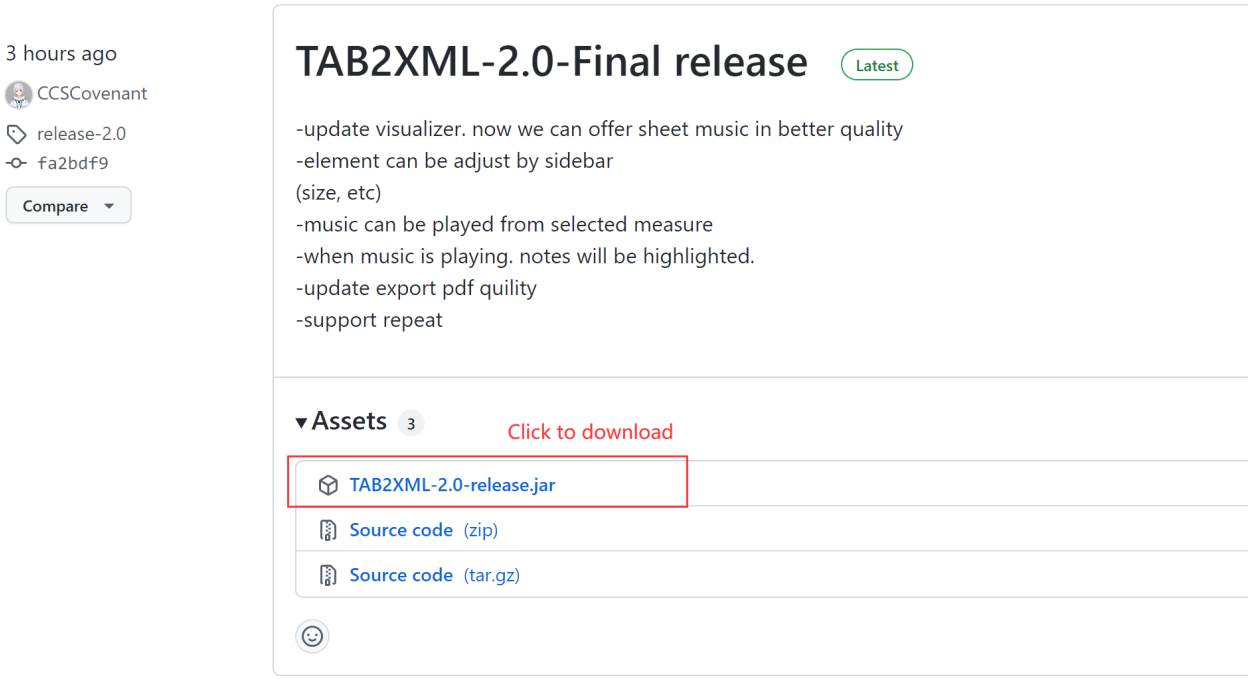


Figure 1: Latest release on the GitHub repository

3. After you download the .jar file, place it into the desired folder.

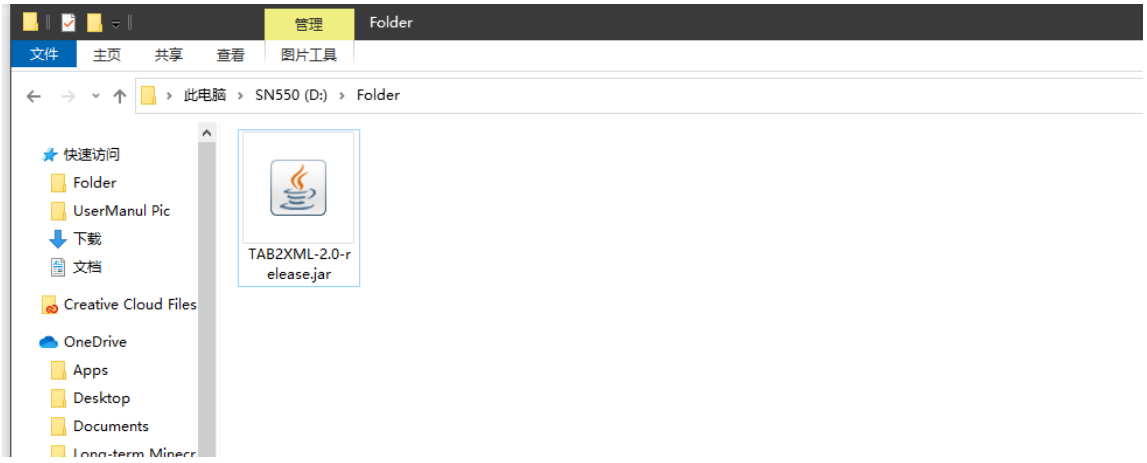


Figure 2: .jar file downloaded and in desired folder

4. Double click the .jar file to run the application and you should be ready to go.

Figure 3: The loading screen when the software is beginning to run.

4. Getting Started:

The list below consists of the features that are provided by our program. Click on the feature below to get to the instructions on using the feature.

5. Common Usage Scenarios:

Convert Text-based Tablature into XML File

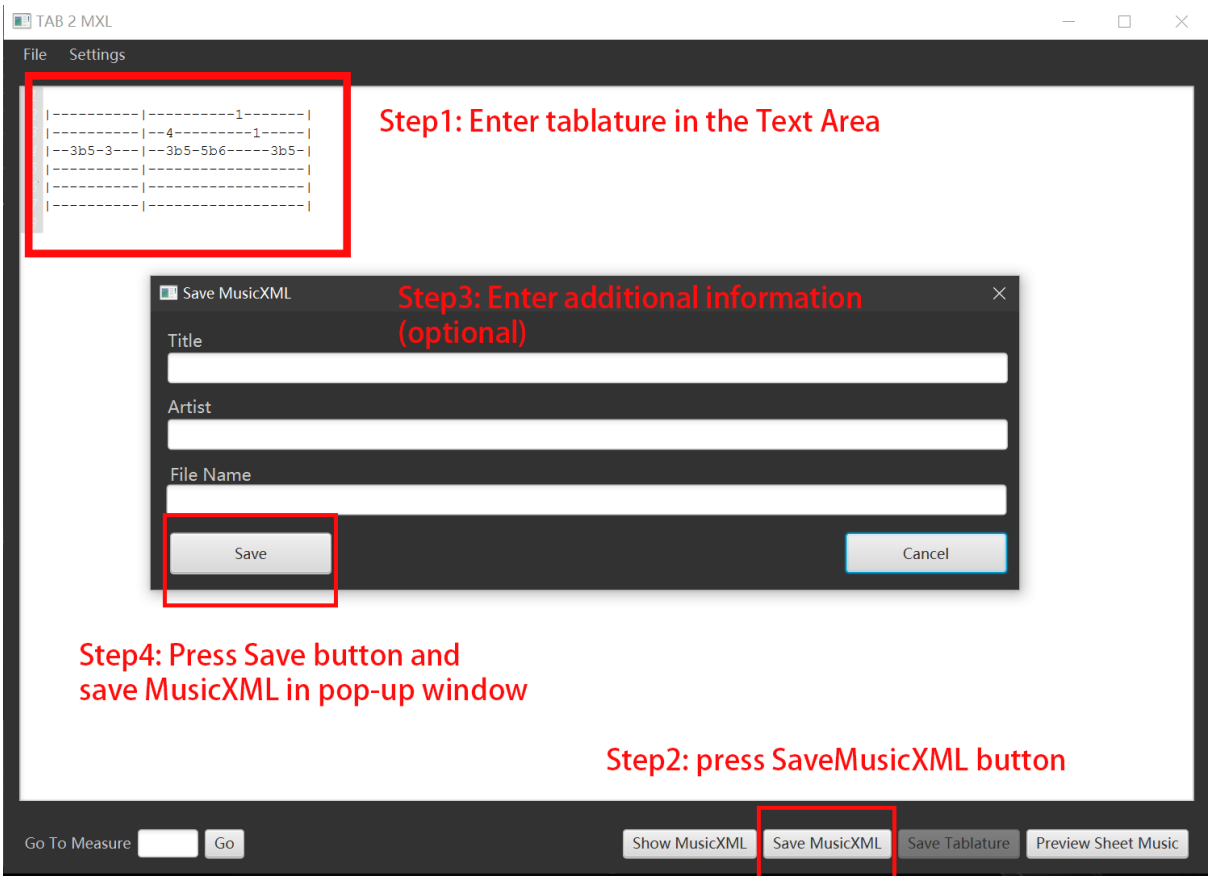


Figure 4: Steps to Converting Text-based Tablature into XML file

You can also check the video instructions on how to use this feature.

Step 1. Click 'file -> open' and choose your file, or copy and paste your text file into the text field.

Note: if your text-based tablature is not recognized by the program and does not let you proceed to step 2, check the Appendix for input requirements.

Step 2. Press the "Save MusicXML" button.

Step 3. (optional): add title, artist, or file name in the pop-up window.

Step 4. Save MusicXML in the pop-up window.

Convert Text-based Tablature into Sheet Music

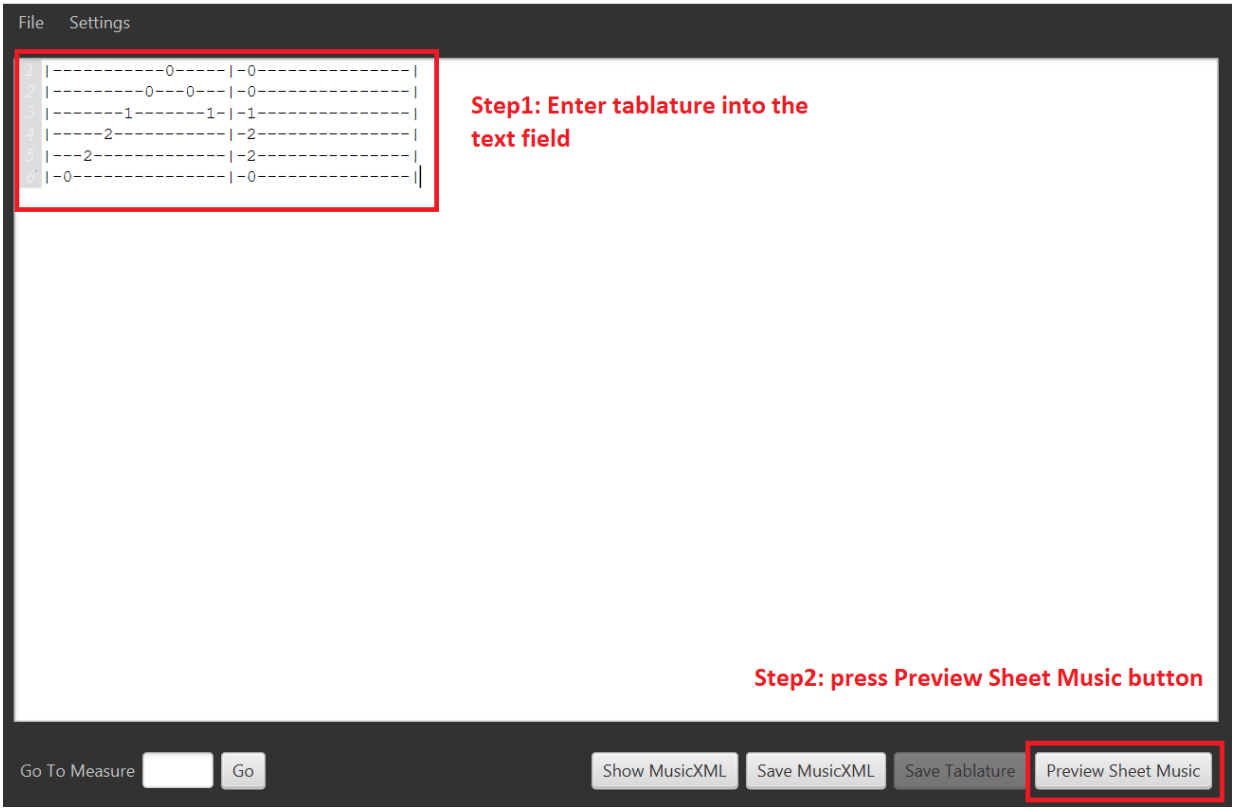


Figure 5: Steps to Previewing the Sheet Music

You can also check the video instructions on how to use this feature.

Step 1. Click 'file -> open' and choose your file, or copy and paste your text file into the text field.

Note: if your text-based tablature is not recognized by the program and does not let you proceed to step 2, check the Appendix for input requirements.

Step2. Press the "Preview Sheet Music" button. A window will pop up. you can preview the generated sheet music in this window

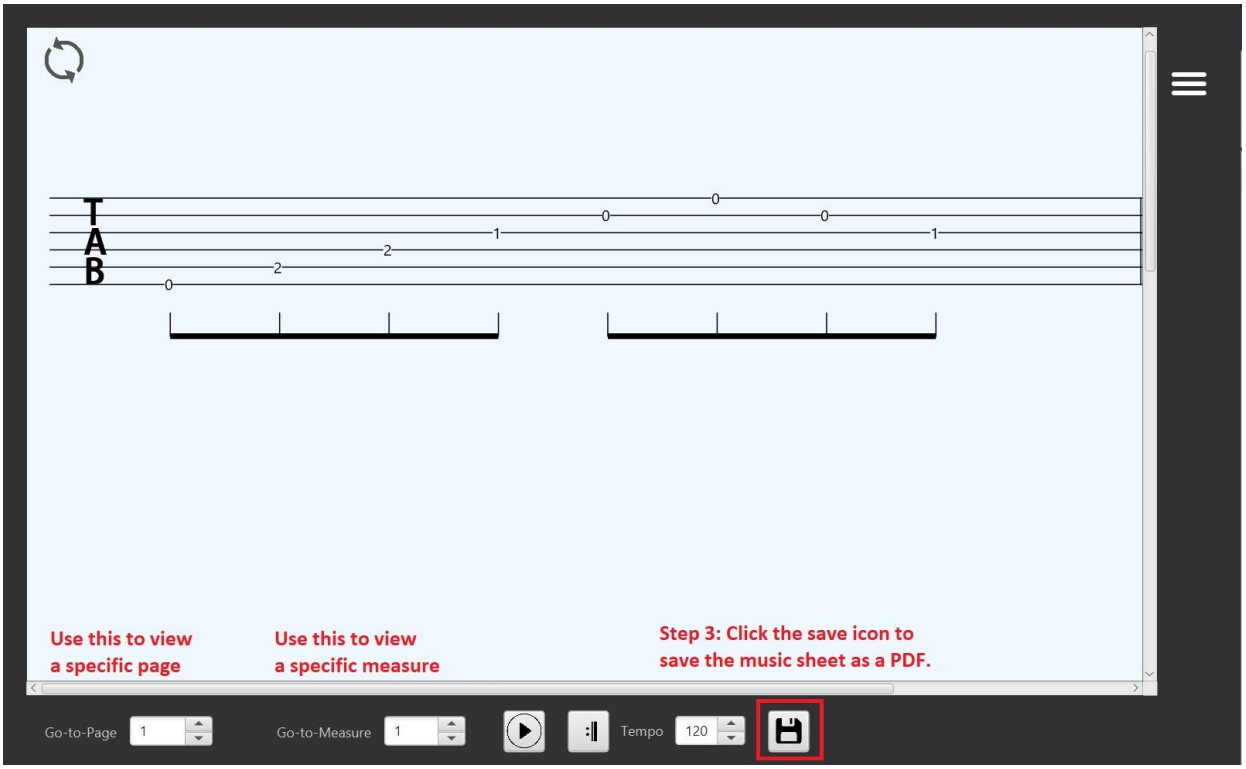


Figure 6: Pop-up window with the Sheet Music

Step 3. Click the save icon and save the PDF file in the pop-up window.

Edit the Generated Sheet Music

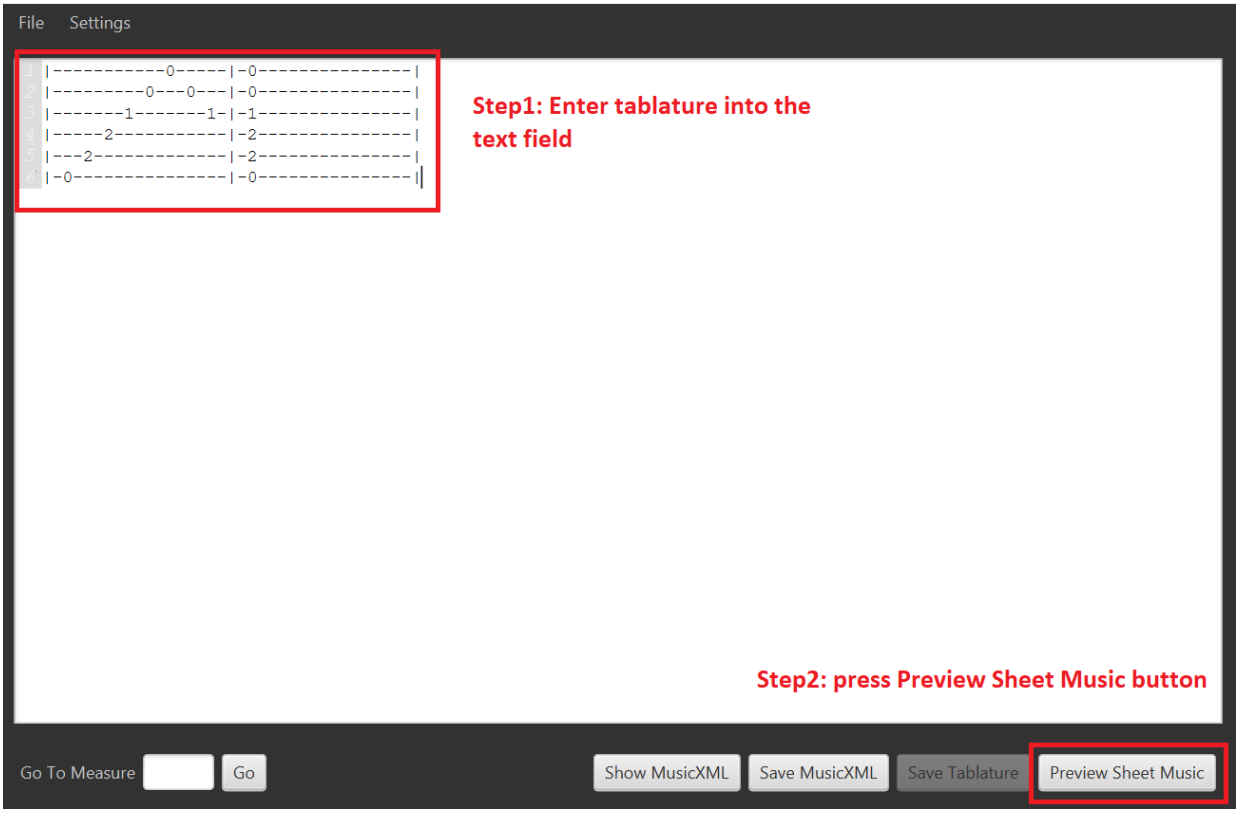


Figure 7: Steps to Previewing the Sheet Music

You can also check the video instructions on how to use this feature.

Step 1. Click 'file -> open' and choose your file, or copy and paste your text file into the text field.

Note: if your text-based tablature is not recognized by the program and does not let you proceed to step 2, check the Appendix for input requirements.

Step 2. Press the "Preview Sheet Music" button.

A window will pop up. You can preview the generated sheet music in this window.

In this window, you can perform the following actions:

- **Adjust display settings:**

  Zoom-in/Zoom-out of Music Sheet

  To zoom in on the music sheet, press 'ctrl + pg up' on your keyboard. To zoom out of the music sheet, press 'ctrl + pg dn' on your keyboard.

Go-to-page Feature

When dealing with larger text-based tablatures, our system allows the user to navigate through the previewer easily. You can use the ‘Go-to-page’ function to change the pages of the previewed music sheet.

Go-to-measure Function

When dealing with larger text-based tablatures, our system allows the user to navigate through the previewer easily. You can use the ‘Go-to-measure’ function to easily access and view different measures of the previewed music sheet.

- **Select an element**

  Left click on a note or measure. If it is highlighted, it means you have selected it. Click the note or measure again to deselect it.

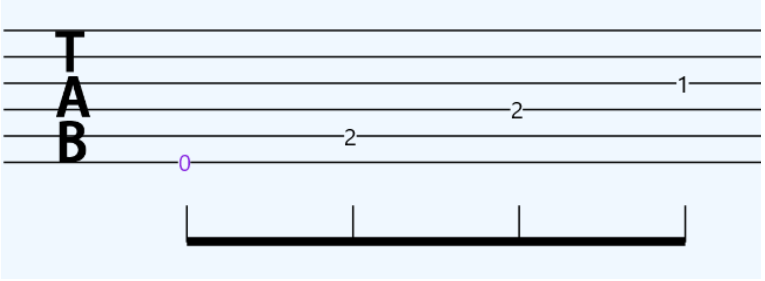


Figure 8: Highlight Note ‘0’ is Selected

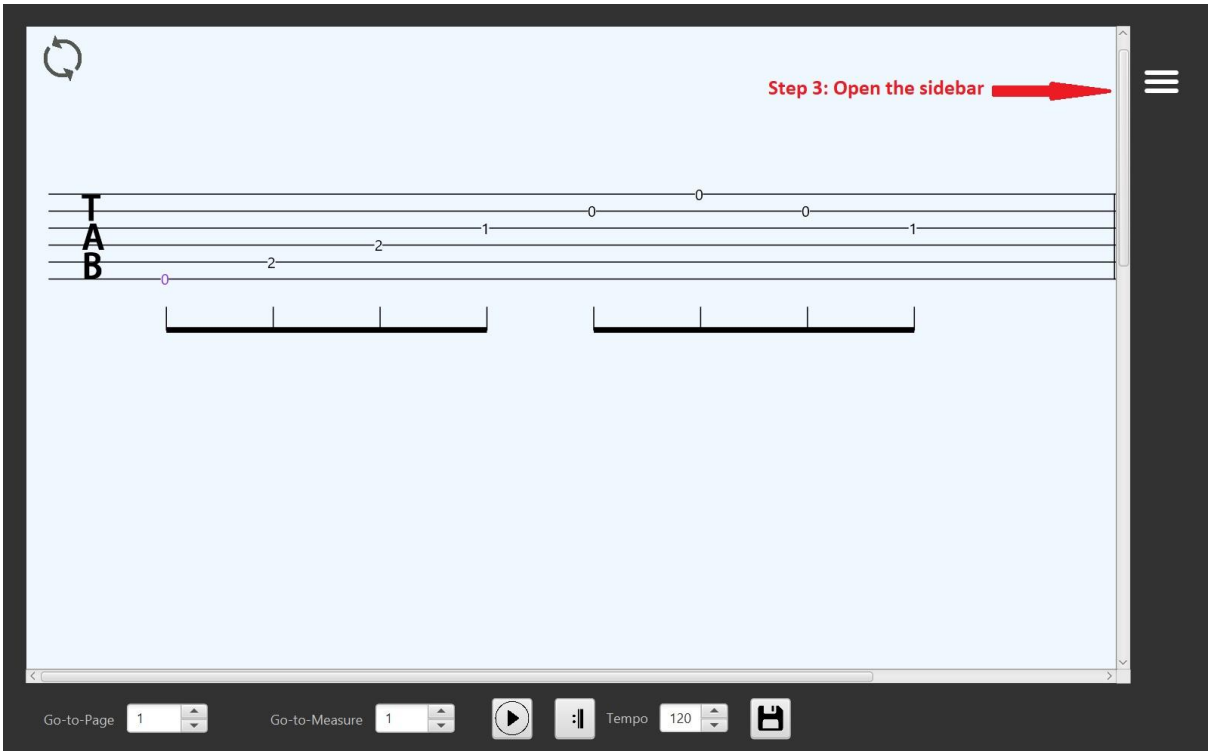


Figure 9: Where to Find the Sidebar

Step 3: Open the sidebar.

Click the icon in the left top corner. It will open a configuration sidebar.

The sidebar will show the current configuration of the element that you selected. If you do not select anything, the sidebar will show you the global configurations (which apply to every measure/element).

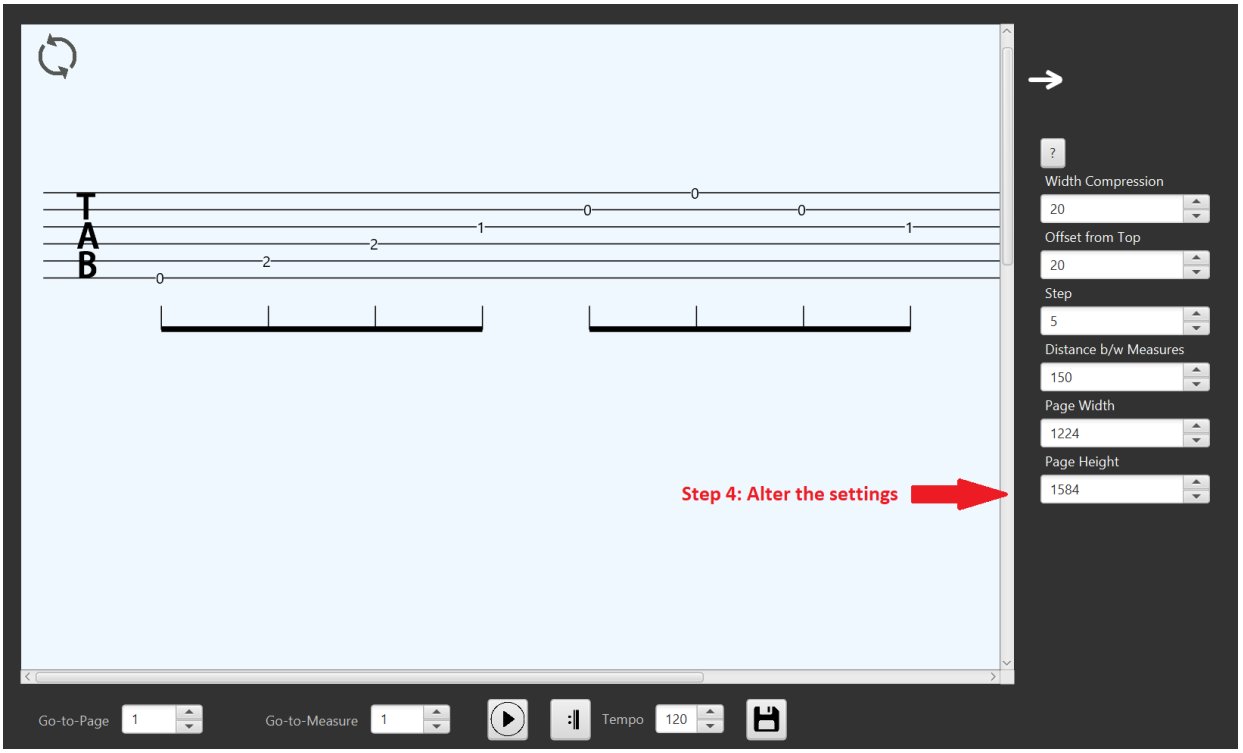


Figure 10: Sidebar with Global Configurations

Step 4: Adjust the values in the sidebar.

Changes will be automatically applied once you enter a new value.

Visit the Appendix for details about each value.

Play the Text-based Tablature

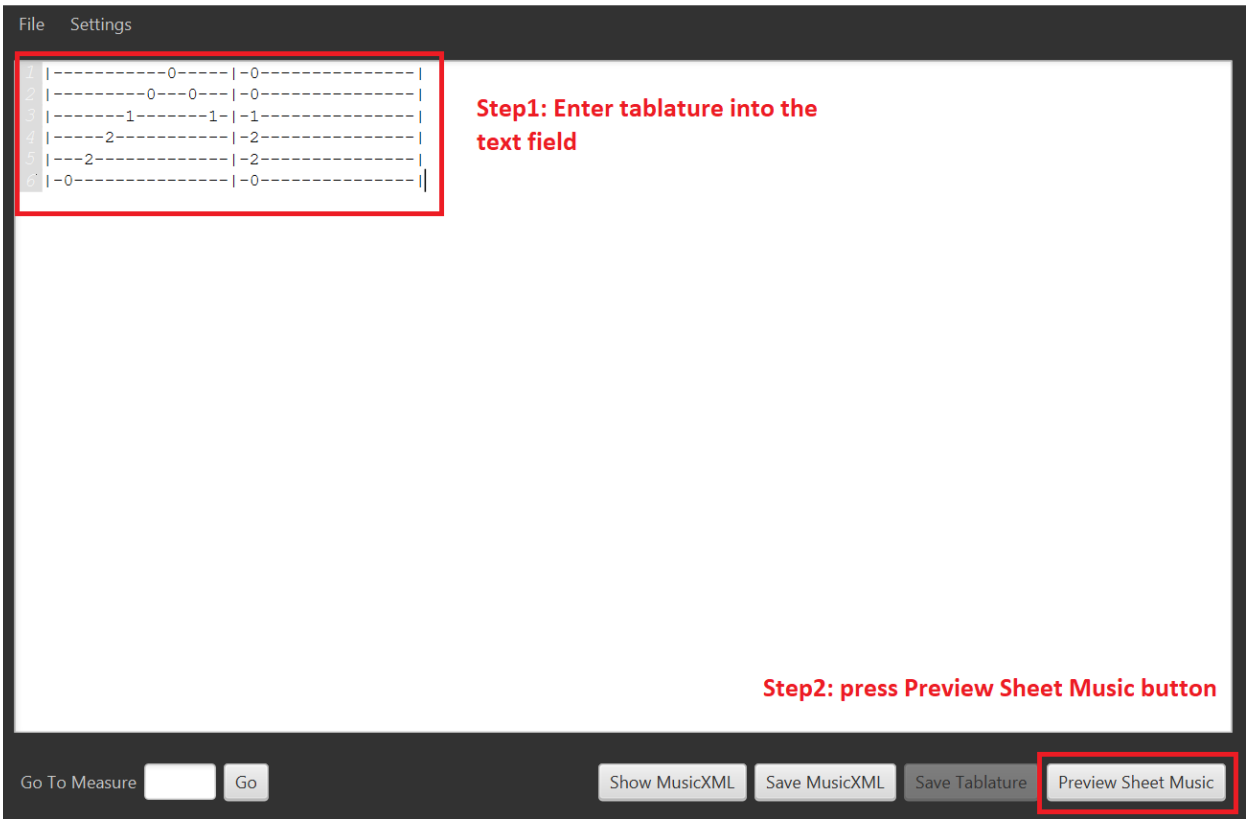


Figure 11: Steps to Previewing the Sheet Music

You can also check the video instructions on how to use this feature.

Step 1. Click 'file -> open' and choose your file, or copy and paste your text file into the text field.

Note: if your text-based tablature is not recognized by the program and does not let you proceed to step 2, check the Appendix for input requirements.

Step 2. Press the "Preview Sheet Music" button

A window will pop up. you can preview the generated sheet music in this window.

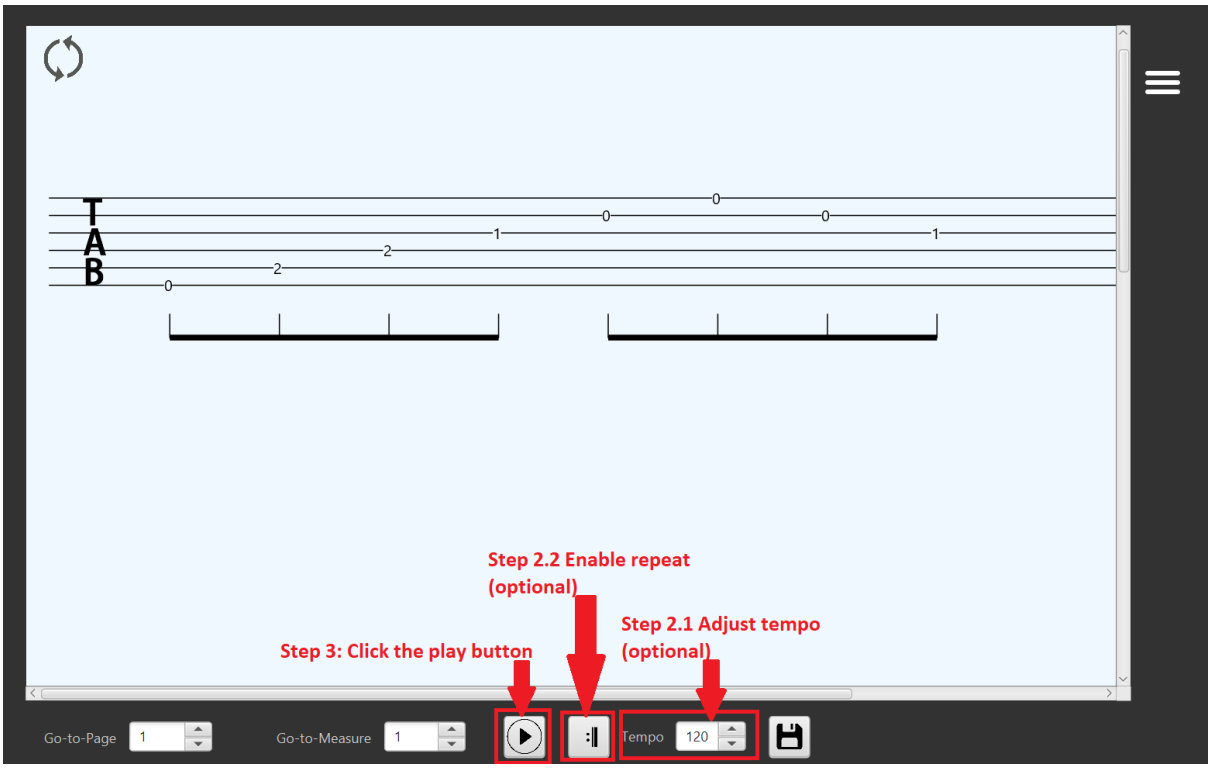


Figure 12: From where to Play, Enable Repeat and Adjust Tempo

Step 2.1: Adjust the tempo. (optional).

Step 2.2: Enable/disable the repeat (optional).

Step 3: Click the play button.

Music will be played from the selected measure. If you do not select anything, it will play from the beginning. The notes that are currently playing will be highlighted when music is playing.

Step 4: (optional) stop music: Click the play button again in order to stop the music.

Appendix 1: Understanding Errors

(Source: https://github.com/Stan15/TAB2XML)

When you run the program, you will be able to see a text field at the center of the screen, shown below. This is where you paste your tablature .txt file.

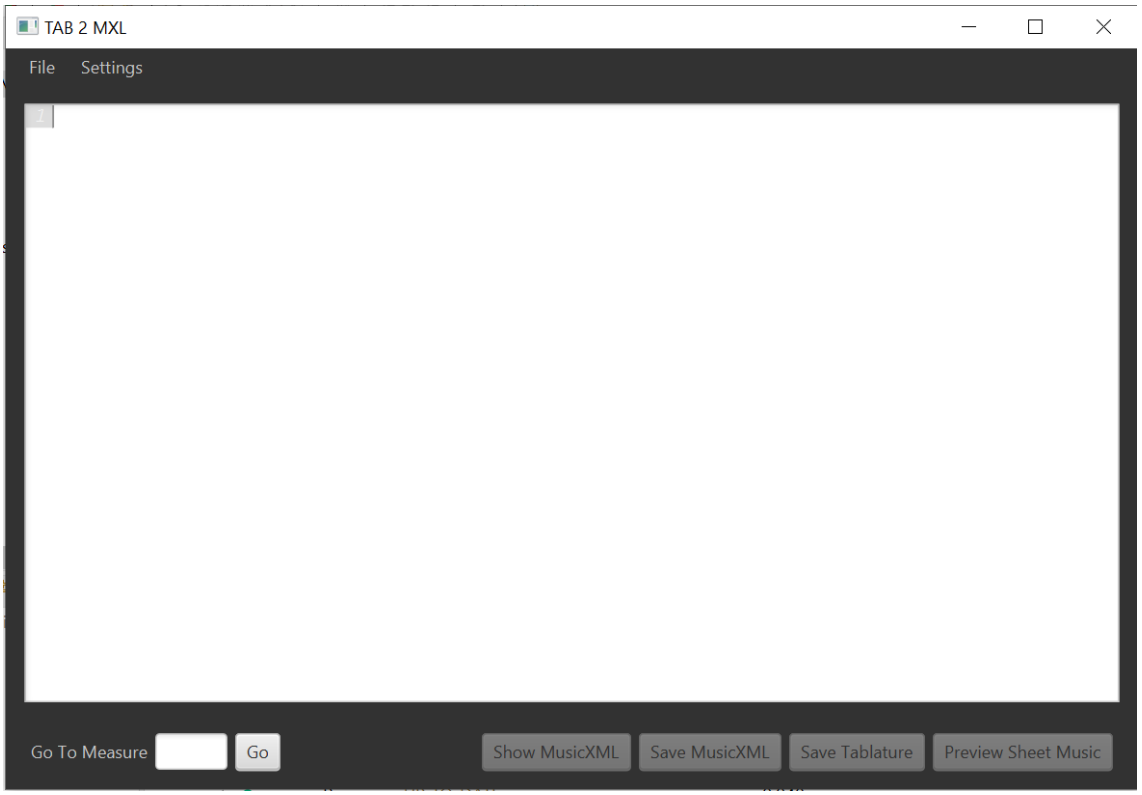


Figure 1: Initial Screen of the TAB2XML

1. To put your input, click ‘file -> open’ and choose your file, or copy and paste your text file into the text field.

2. Once your input is in the text field, the system lets you know if there is any unidentifiable information which should be corrected for optimal conversion.The system highlights the erroneous areas of your input and displays a message over the highlight when you hover over the highlight with your cursor.

   There are 4 levels of highlighting:

i. Red highlight: This is used to identify errors that may critically affect the output of the conversion.

ii. Yellow highlight: Errors with this highlight are less critical, but we do not guarantee an accurate output with these errors.

iii. Blue HIghlight: Errors with this highlight will likely still produce an accurate output but may lead to a different output than is expected.

iv. Grey highlight: This highlight is used to identify content that may have little to no effect on the output.

Error Examples

Detailed below are a few examples of different error highlighting scenarios:

- Red highlight: “this note could not be identified” as shown in the image below.
- This is used to identify elements that are either not supported or not identified as valid measure annotations.

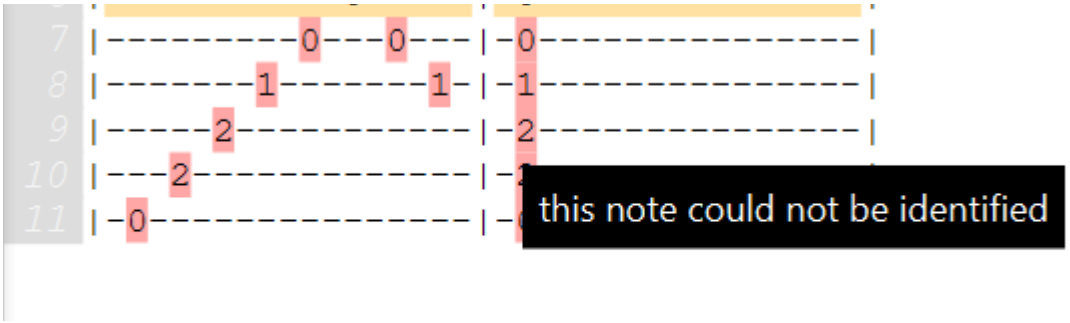


Figure 2: Error: Red Highlight

- Yellow highlight: "Unequal measure line lengths may lead to incorrect note durations." as shown in the image below.
- If you get such an error on a measure that seems to be accurate, make sure no text is written on the side of the measure as this makes the system identify it as two different measures.
- Otherwise, ensure that the measure line lengths match up and are equal.

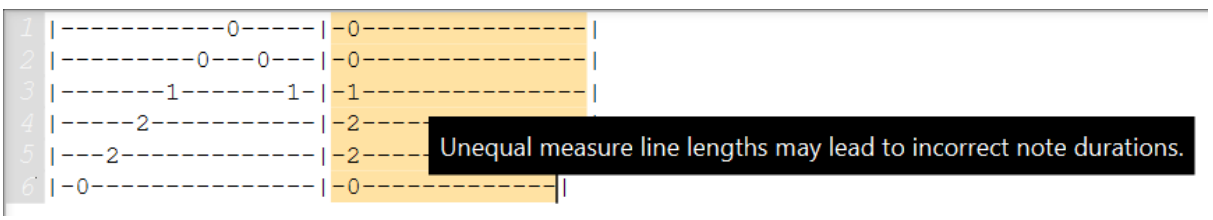


Figure 3: Error: Yellow Highlight

- Blue Highlight: “Unrecognized text, will be ignored." & "Could not determine timing correctly: Non integer divisions" as seen in the images below.
- This error is to inform the users that the objects do not have the same length, and mainly to inform users that the timing was not validated, meaning there may be some error with the input.

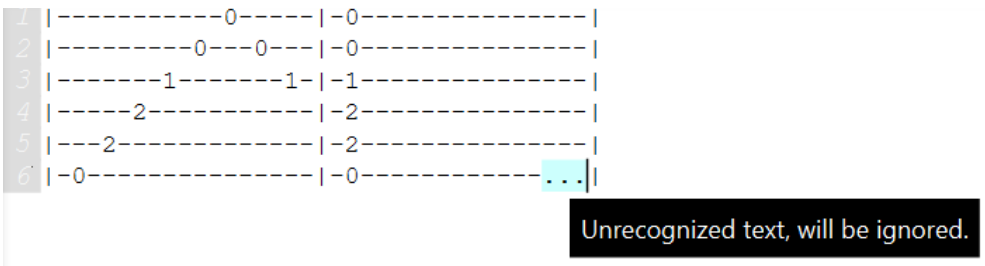


Figure 4: Error: Blue Highlight

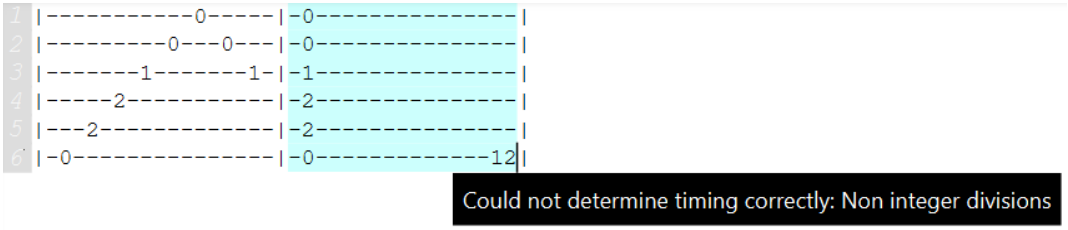


Figure 5: Error: Blue Highlight

- Grey highlight: “This text will be ignored.” (shown in the image below).
- This error is to highlight anything outside the recognized tab sections. These will be ignored by the system, and not identified as a score object (i.e measure, note, repeat instruction, e.t.c.).

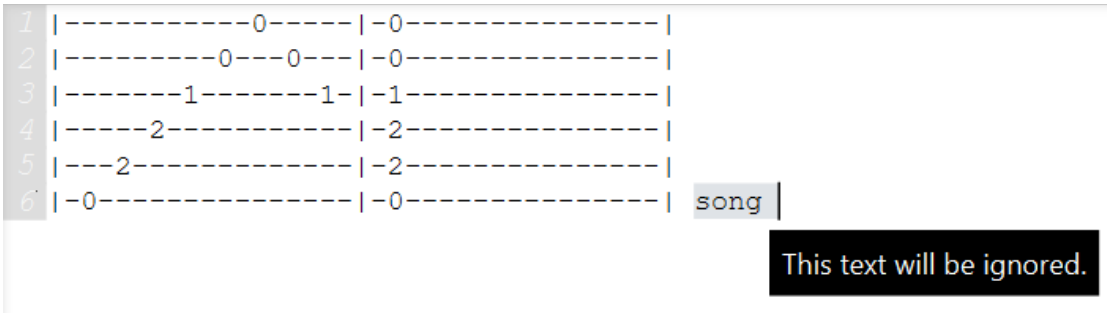


Figure 6: Error: Grey Highlight

Note: There are more error scenarios that may occur, but they are all categorised into the three groups identified above.

4. For a proper output, make sure there are no red or yellow highlights in your tablature. It is recommended that you resolve blue highlight errors, but grey highlights can largely be ignored.

    - How to fix errors:

        Ensure that the number of lines in a measure is correct for the given instrument.

        Remove all unrecognisable notations in tablature and replace with dash '-'.

        Remove all texts which is placed around score bars except for key notation.

        (How to fix instruction video: https://drive.google.com/file/d/174oWzswHkvnTvyask_AUpYKRjKmuz3_m/view?usp=sharing

    Note: If you removed all yellow and red highlights, it is ready to be converted.

    (If there is no yellow and red highlight in score bars information, you can skip this step)

Appendix 2: Input Requirements

(Source: https://github.com/Stan15/TAB2XML)

1.1 Measure instructions (Repeats and time signature)

This program allows for the application of repeats and time signatures to individual measures. Here, we will go over the input restrictions governing these features.

Some sample tablature text files that meet the requirements can be found in the project folder in the directory TAB2XML/src/test/resources/test_tab_files.

For instructions in general, the following requirements are outlined:

1. For a line to be interpreted as having instructions, it must only be composed of valid instructions separated by spaces and nothing else.

2. The 'tab' button should not be used in your instruction lines as this might result in the system not applying the instructions to the correct measure.

3. For your instructions to be recognized, the line directly below the instruction line must be a measure line or another instruction line (instruction chaining is allowed).

4. Lines of instructions are chained by connecting the lines by one new line.

5. The order of priority for applying instructions is left to right, up to down.

Repeats:

For repeats, the following input requirements must be followed for repeats to be correctly applied

1. Repeats must start and end with a vertical bar, and can have any combination of spaces or dashes "-" in-between, as seen below.

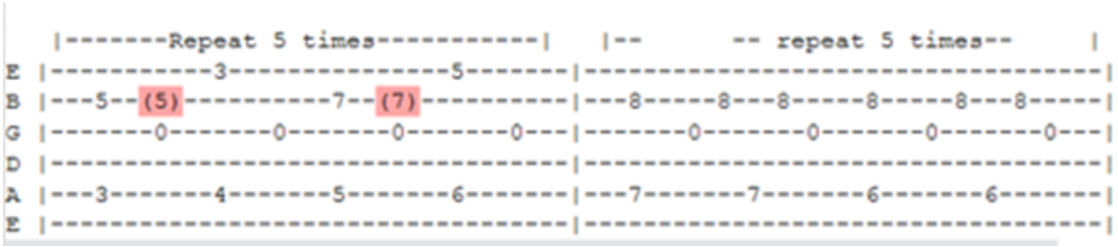


Figure 7: Demonstration of Repeats

2. Repeats can be notated in any one of the three below-stated ways.

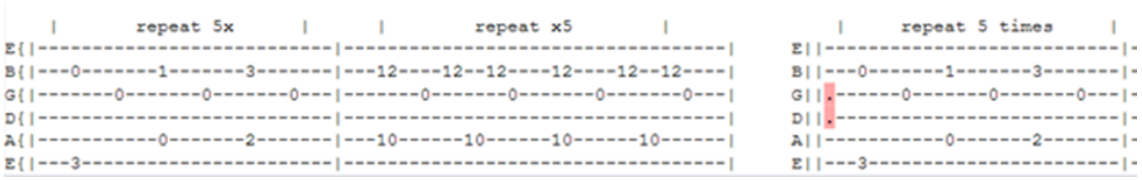


Figure 8: Three ways to Declare Repeat

Time Signatures:

1. The list of possible time signatures has been artificially restricted to the following generally accepted time signatures: 2/4, 2/2, 3/8, 3/4, 4/8, 4/4, 4/2, 6/8, 6/4, 9/8, 9/4, 12/8, and 12/4.

2. If an invalid time signature is provided, the following error is received:

Figure 9: Invalid time signature error

3. The default time signature is 4/4 if no time signature instruction is provided.

4. Time signatures with a beat or beat count consisting of three or more values are not recognized as instructions and will make the line of instructions invalid.

1.2 Measures

Some sample tablature text files that meet the below requirements can be found in the project folder in the directory TAB2XML/src/test/resources/test_tab_files. The tablature file input into the program must meet the following requirements:

5. The tablature file must start with a vertical line after the string name.

6. you may not have text by the side of a measure which itself is not a measure.

7. The line names must all be lower caps, except for the E string which can be lower caps to distinguish the lower e string from the upper E string.

Appendix 3: List of Settings

Grace Spacing

The distance between a grace note and a normal note can be adjusted through this.

Measure Spacing (Before)

The spacing before the measure.

Minimum Note Spacing

The minimum space between notes. If measures do not fit in line with this spacing, it will be put in the next line.

Note Head Horizontal Offset

The horizontal placement of a specific note can be controlled through this value. The value cannot be so great that it interferes with another note.

Note Size

The size of a specific note can be controlled through this value. The value cannot be so great that it interferes with another line on the staff.

Dot Offset

The placement of the dot after a note can be controlled through this setting.

Dot Size

The size of the dot.

Beam Spacing

The spacing between the beams can be adjusted through this setting.

Beam Thickness

The thickness between the beams can be adjusted through this setting.

Drum Stem Height / Guitar Stem Height (End)

Drum Stem Height / Guitar Stem Height (Start)

These settings control the length of the stems of the notes.

Page Width and Page Height

The page size of the music sheet is controlled with these values.

Width Compression

This horizontally compresses the music sheet.

Distance b/w Measures

This adjusts the distance between each line of measures.

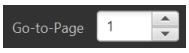
Step

Controls the distance between two steps. It will directly affect note size, the gap between staff lines, and the position of notations.

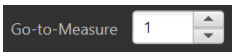
Appendix 4: List of Settings and Features

Zoom-in/Zoom-out of Music Sheet

To zoom in on the music sheet, press ‘ctrl + pg up’ on your keyboard. To zoom out of the music sheet, press ‘ctrl + pg dn’ on your keyboard.

Go-to-page 

When dealing with larger text-based tablatures, our system allows the user to navigate through the previewer easily. You can use the ‘Go-to-Page’ function to change the pages of the previewed music sheet.

Go-to-measure 

When dealing with larger text-based tablatures, our system allows the user to navigate through the previewer easily. You can use the ‘Go-to-Measure’ function to easily access and view different measures of the previewed music sheet.

Play 

Our system allows for users to be able to easily play their text-based tablature..

Repeat 

Our system allows for users to be able to play their text-based tablature on repeat.

Adjust Tempo Feature 

The TAB2XML allows for users to be able to play their text-based tablature using different tempos, so it has the option for users to adjust the tempo to their liking. Users can input a number from 0 - 240, or use the up and down arrows to increase or decrease the tempo.

Save Music Sheet Feature 

The TAB2XML allows for users to be able to save their text-based tablature as PDFs.

Sidebar Feature 

The TAB2XML allows for users to customise the previewed music sheets. Users can use the sidebar button to access the various adjustable factors which affect the spacing of the file music sheet.

Restore to Default Feature 

The TAB2XML allows for users to revert their adjustments and customization back to the default settings.

Appendix 5: Useful Terminology for Music

Here are some important terms relating to music theory to ensure that users make the best of TAB2XML.

Staff/Stave: a set of five horizontal lines and the four spaces between the lines. Each line or space on the staff represents a specific pitch.

Clef: a musical-notation symbol at the beginning of a music staff, indicating the pitch of the notes on the staff.

Note Value: indicates the duration of a note

Note Head: a part of a note, which duration of note and pitch by placement on the staff

Tempo: pace at which the beats are played.

Measure/Bar: a single unit of time that has a specific number of beats at a given tempo.

Stem: the straight part of a note, connecting the note flag and the notehead.

Note Flag: attached to a note stem indicating the beat division of that note. A flag added to any note will cut the duration of that note in half.

Time Signature: a sign that indicates the metre of a composition; fraction where the numerator states the number of beats in a measure, and the denominator states the note value of each beat.

Pitch: refers to the frequency of vibration of the sound waves causing some sounds to sound highway or lower.

Chord: a set of pitches/frequencies which consist of multiple notes