

Unofficial MusicXML test suite

1 Introduction

Why a MusicXML test suite?

This test suite of sample MusicXML (<http://www.musicxml.org/>) files is supposed to fill a severe gap for all developers implementing MusicXML support in their application: There is no complete test suite of MusicXML files available for testing purposes.

Downloading the test suite

The complete set of MusicXML test files contained in this suite can be downloaded here ([MusicXML-TestSuite-0.1.zip](#)) as a ZIP archive.

License of the test suite

This collection of MusicXML test files is distributed under the MIT license (<http://www.opensource.org/licenses/mit-license.php>), which means that you can use the files for any purpose, as long as you leave the copyright notice (or the LICENSE file) intact.

Connection with LilyPond (<http://lilypond.org/>)

At the same time as providing a generic test suite for MusicXML document, this test suite also serves as proofs for the `musicxml2ly` script provided with LilyPond 2.20.0. The images shown in the Chapter 2 [Test cases], page 4, chapter were generated by running `musicxml2ly` and `lilypond` on the MusicXML files. As `musicxml2ly` does not yet perfectly support every single aspect of MusicXML, the output is not supposed to be used as a definitive reference rendering, but rather as an indication how one particular application supports and interprets each of the test files.

If something does not seem right in the output, it might either be that this feature has not been implemented yet, has been wrongly implemented, or a regression has crept in recently...

In the web version of this document, you can click on the file name or figure for each example to see the corresponding `.ly` intermediary file.

Structure of this test suite

Each test file (typically hand-crafted from the MusicXML "specification") checks one particular aspect of MusicXML. A short description of the particular feature for a file is given element inside the file in a comment element of the form:

```
<identification><miscellaneous>
  <miscellaneous-field name="description"> .... </miscellaneous-field>
</miscellaneous></identification>
```

The files are categorized by their first two digits with the following meaning:

- 01-03 ... Basics: Pitches, Rests, Rhythm
- 11-13 ... Staff attributes: Time signatures, Clefs, Key signatures
- 21-24 ... Note settings: Chorded notes, note heads, tuplets, grace notes
- 31-33 ... Notations and articulations: Dynamics (staff-attached), Notations (note-attached), Spanners
- 41-44 ... Parts: Multiple parts, multi-voice parts, multi-staff parts
- 45-46 ... Measure issues and repeats
- 51-52 ... Page issues: Header fields, page layout

- 55-59 ... Exact positioning of items, offsets, etc.
- 61-69 ... Vocal music
- 71-75 ... Instrument-specific: Guitar (Chord, fretboards), Transposing instruments, Percussion, Figured Bass, Others
- 81-89 ... MIDI generation (all sound-related issues)
- 90-99 ... Various Other: Compressed MusicXML files, compatibility with broken MusicXML files exported by other applications

Some of the categories (in particular the exact item positioning and the MIDI generation don't have any test cases yet.

2 Test cases

01 ... Pitches

All pitches from G to c'' in ascending steps; First without accidentals, then with a sharp and then with a flat accidental. Double alterations and cautionary accidentals are tested at the end.

01a-Pitches-Pitches.xml

Pitches and accidentals

The musical score consists of four staves of music in treble clef, 4/4 time. The first staff starts with a common time signature 'C' and shows a sequence of notes ascending from G4 to c''5. The second staff starts at measure 8 and continues the sequence with various accidentals (sharps and flats) and double alterations. The third staff starts at measure 14 and continues the sequence with cautionary accidentals. The fourth staff starts at measure 20 and continues the sequence, ending with a double bar line.

All pitch intervals in ascending jump size.

01b-Pitches-Intervals.xml

Various pitches and interval sizes

The musical score consists of two staves of music in treble clef, 2/4 time. The first staff starts with a 2/4 time signature and shows a sequence of notes with various interval sizes and accidentals. The second staff starts at measure 11 and continues the sequence with various interval sizes and accidentals.

The <voice> element of notes is optional in MusicXML (although Dolet always writes it out). Here, there is one note with lyrics, but without a voice assigned. It should still be correctly converted.

01c-Pitches-NoVoiceElement.xml

1. A

Some microtones: c flat-and-a-half, d half-flat, e half-sharp, f sharp-and-a half. Once in the lower and once in the upper region of the staff.

01d-Pitches-Microtones.xml

Accidentals can be cautionary or editorial. Each measure has a normal accidental, an editorial, a cautionary and an editorial and cautionary accidental.

01e-Pitches-ParenthesizedAccidentals.xml

Microtone accidentals can be cautionary or editorial. Each measure has a normal accidental, an editorial, a cautionary and an editorial and cautionary accidental.

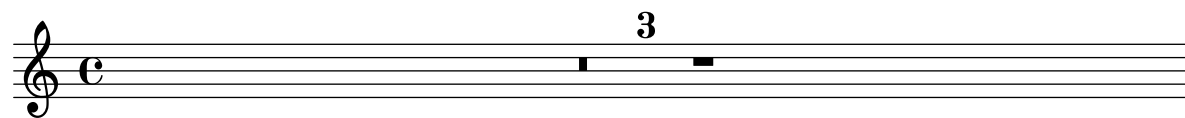
01f-Pitches-ParenthesizedMicrotoneAccidentals.xml

02 ... Rests

All different rest lengths: A two-bar multi-measure rest, a whole rest, a half, etc. until a 128th-rest; Then the same with dotted durations.

02a-Rests-Durations.xml

Rest unit test



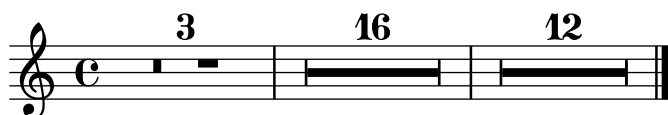
Rests can have explicit pitches, where they are displayed. The first rest uses no explicit position and should use the default position, all others are explicitly positioned somewhere else.

02b-Rests-PitchedRests.xml



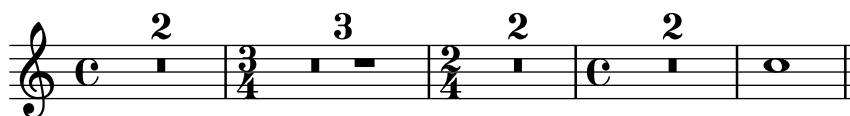
Four multi-measure rests: 3 measures, 15 measures, 1 measure, and 12 measures.

02c-Rests-MultiMeasureRests.xml



Multi-Measure rests should always be converted into durations that are a multiple of the time signature.

02d-Rests-Multimeasure-TimeSignatures.xml



In some cases, a rest might not have its type attribute set (this happens, for example, with voices in Finale, where you don't manually insert a rest).

02e-Rests-NoType.xml



03 ... Rhythm

All note durations, from long, brevis, whole until 128th; First with their plain values, then dotted and finally doubly-dotted.

03a-Rhythm-Durations.xml

The image shows three staves of musical notation. The first staff starts at measure 16 and ends at measure 24. The second staff starts at measure 24 and ends at measure 28. The third staff starts at measure 28 and ends at measure 32. Each staff shows a sequence of notes with increasing complexity in their durations, ending with a double bar line.

Two voices with a backup, that does not jump to the beginning for the measure for voice 2, but somewhere in the middle. Voice 2 thus won't have any notes or rests for the first beat of the measures.

03b-Rhythm-Backup.xml

The image shows a single staff of musical notation in common time (C). The notes are placed in the middle of the first and second measures, illustrating a backup.

Although uncommon, the divisions of a quarter note can change somewhere in the middle of a MusicXML file. Here, the first half measure uses a division of 1, which then changes to 8 in the middle of the first measure and to 38 in the middle of the second measure.

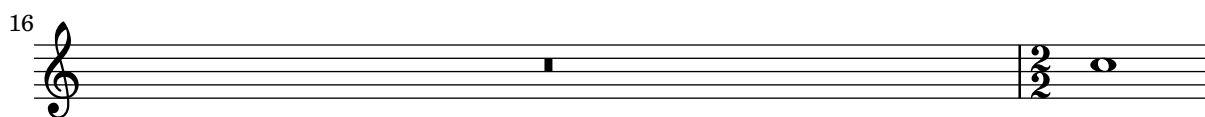
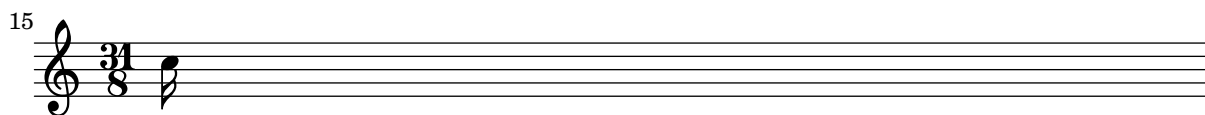
03c-Rhythm-DivisionChange.xml

The image shows a single staff of musical notation in common time (C). The notes are placed in the middle of the first and second measures, illustrating a division change.

Several durations can be written with dots. For multimeasure rests, we can also have durations that cannot be expressed with dotted notes (like 5/8).

03d-Rhythm-DottedDurations-Factors.xml

The image shows two staves of musical notation. The first staff starts at measure 1 and ends at measure 5. The second staff starts at measure 9 and ends at measure 31. Each staff shows a sequence of multimeasure rests with various time signatures, ending with a double bar line.



11 ... Time signatures

Various time signatures: 2/2 (alla breve), 4/4 (C), 2/2, 3/2, 2/4, 3/4, 4/4, 5/4, 3/8, 6/8, 12/8
 11a-TimeSignatures.xml



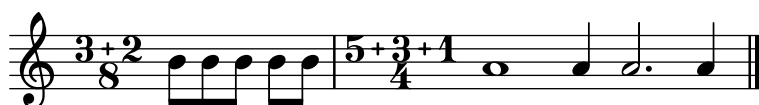
A score without a time signature (but with a key and clefs)

11b-TimeSignatures-NoTime.xml



Compound time signatures with same denominator: $(3+2)/8$ and $(5+3+1)/4$.

11c-TimeSignatures-CompoundSimple.xml



Compound time signatures with separate fractions displayed: $3/8+2/8+3/4$ and $5/2+1/8$.

11d-TimeSignatures-CompoundMultiple.xml



Compound time signatures of mixed type: $(3+2)/8+3/4$.

11e-TimeSignatures-CompoundMixed.xml



A time signature of 3/8 with the symbol="cut" attribute and two symbol="single-number" attributes with compound time signatures. Shall the symbol be ignored in this case?

11f-TimeSignatures-SymbolMeaning.xml



Time signature displayed as a single number.

11g-TimeSignatures-SingleNumber.xml



Senza-misura time signature

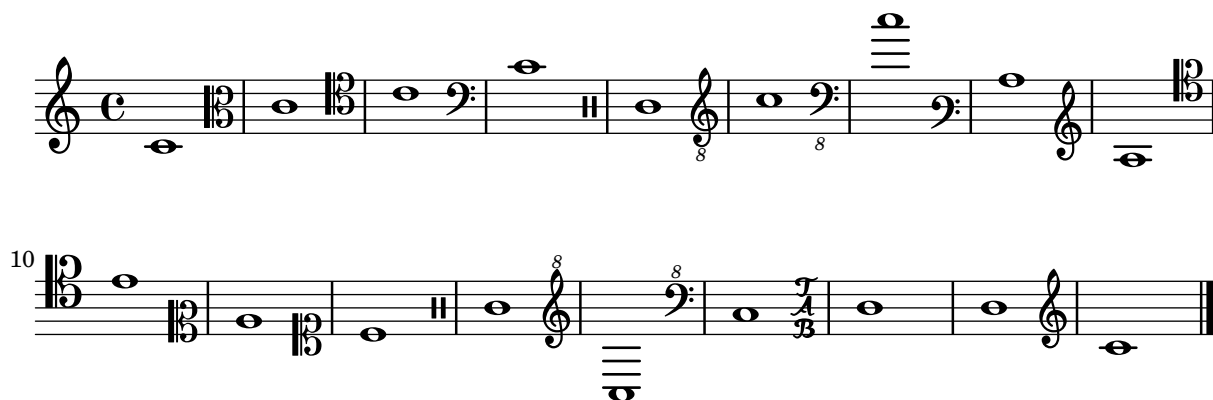
11h-TimeSignatures-SenzaMisura.xml



12 ... Clefs

Various clefs: G, C, F, percussion, TAB and none; some are also possible with transposition and on other staff lines than their default (e.g. soprano/alto/tenor/baritone C clefs); Each measure shows a different clef (measure 17 has the "none" clef), only measure 18 has the same treble clef as measure 1.

12a-Clefs.xml



A score without any key or clef defined. The default (4/4 in treble clef) should be used.

12b-Clefs-NoKeyOrClef.xml



13 ... Key signatures

Various key signature: from 11 flats to 11 sharps (each one first one measure in major, then one measure in minor)

13a-KeySignatures.xml

Different Key signatures

The image displays a series of musical staves illustrating 11 different key signatures. The first seven staves (measures 1-37) show key signatures with 11 flats, 10 flats, 9 flats, 8 flats, 7 flats, 6 flats, and 5 flats. The last four staves (measures 37-42) show key signatures with 4 sharps, 5 sharps, 6 sharps, and 7 sharps. Each staff begins with a treble clef and a 2/4 time signature. The notation includes a key signature symbol at the start of each staff, followed by a sequence of notes and rests. The notes are primarily quarter notes, with some half notes and eighth notes. The rests are also quarter notes. The sequence of notes and rests is consistent across all staves, but the key signature changes from measure to measure.

All different modes: major, minor, ionian, dorian, phrygian, lydian, mixolydian, aeolian, and locrian; All modes are given with 2 sharps.

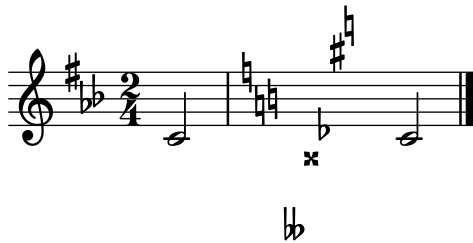
13b-KeySignatures-ChurchModes.xml

The image shows a single musical staff with a treble clef and a common time signature (C). The key signature is two sharps (F# and C#). The staff contains a sequence of notes and rests representing the 8 church modes: major, minor, ionian, dorian, phrygian, lydian, mixolydian, aeolian, and locrian. The notes are quarter notes, and the rests are quarter notes. The sequence of notes and rests is consistent across all modes, but the key signature changes from mode to mode.

1. major minor ionian dorian phrygian lydian mixolydian aeolian locrian

Non-traditional key signatures, where each alteration is separately given. Here we have (f sharp, a flat, b flat) and (c flatflat, g sharp sharp, d flat, b sharp, f natural), where in the second case an explicit octave is given for each alteration.

13c-KeySignatures-NonTraditional.xml



Non-traditional key signatures with microtone alterations: (g flat-and-a-half, a flat, b half-flat, c natural, d half-sharp, e sharp, f sharp-and-a-half).

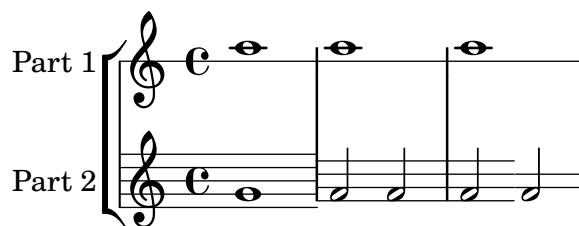
13d-KeySignatures-Microtones.xml



14 ... Staff attributes

The number of staff lines can be modified by using the staff-lines child of the staff-details attribute. This can happen globally (the first staff has one line globally) or during the part at the beginning of a measure and even inside a measure (the second part has 5 lines initially, 4 at the beginning of the second measure, and 3 starting in the middle of the third measure).

14a-StaffDetails-LineChanges.xml



21 ... Chorded notes

One simple chord consisting of two notes.

21a-Chord-Basic.xml



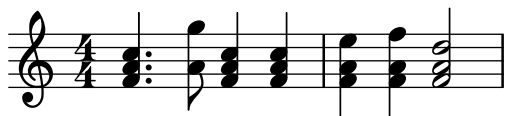
Some subsequent (identical) two-note chords.

21b-Chords-TwoNotes.xml



Some three-note chords, with various durations.

21c-Chords-ThreeNotesDuration.xml



Chords in the second measure, after several ornaments in the first measure and a p at the beginning of the second measure.

21d-Chords-SchubertStabatMater.xml



Check for proper chord detection after a pickup measure (i.e. the first beat of the measure is not aligned with multiples of the time signature)!

21e-Chords-PickupMeasures.xml



Between the individual notes of a chord there can be direction or harmony elements, which should be properly assigned to the chord (or the position of the chord).

21f-Chord-ElementInBetween.xml



22 ... Note settings, heads, etc.

Different note styles, using the <notehead> element. First, each note head style is printed with four quarter notes, two with filled heads, two with unfilled heads, where first the stem is up and then the stem is down. After that, each note head style is printed with a half note (should have an unfilled head by default). Finally, the Aiken note head styles are tested, once with stem up and once with stem down.

22a-Noteheads.xml



12

back slashed normal cluster none slash triangle diamond square

18

cross x circle-x inverted triangle arrow down arrow up slashed back slashed

22

normal cluster do re mi fa so

28

la ti do re mi fa so la ti do do re mi fa so la ti do

Staff-connected note styles: slash notation, hidden notes (with and without hidden staff lines)

22b-Staff-Notestyles.xml

1. slash, no stem slash, with stem normal settings restored

Different note styles for individual notes inside a chord, using the <notehead> element.

22c-Noteheads-Chords.xml

1. normal cross
2. triangle
3. slash

Parenthesized note heads. First, a single parenthesized note is tested, once with a normal and then with a non-standard notehead, then two chords with some/all parenthesized noteheads and finally a parenthesized rest.

22d-Parenthesized-Noteheads.xml

23 ... Triplets, Tuplets

Some tuplets (3:2, 3:2, 3:2, 4:2, 4:1, 7:3, 6:2) with the default tuplet bracket displaying the number of actual notes played. The second tuplet does not have a number attribute set.

23a-Tuplets.xml



Different tuplet styles: default, none, x:y, x:y-note; Each with bracket, slur and none. Finally, non-standard 4:3 and 17:2 tuplets are given.

23b-Tuplets-Styles.xml



Displaying tuplet note types, that might not coincide with the displayed note. The first two tuplets take the type from the note, the second two from the <time-modification> element, the remaining pair of tuplets from the <tuplet> notation element. The tuplets in measure 3 specify both a number of notes and a type inside the <tuplet-actual> and <tuplet-normal> elements, the ones in measure 4 specify only a note type (but no number), and the ones in measure 5 specify only a number of tuplet-notes (but no type, which is deduced from the note's type). The first tuplet of measures 3-5 uses 'display-type="actual"', the second one 'display-type="both"'. FIXME: The tuplet-normal should coincide with the real notes!

23c-Tuplet-Display-NonStandard.xml



Tuplets can be nested. Here there is a 5:2 tuplet inside a 3:2 tuple (all consisting of written eighth notes).

23d-Tuplets-Nested.xml



Tremolo tuplets are tuplets on single notes with a tremolo ornament. The application shall correctly import these notes with 2/3 or their time...

23e-Tuplets-Tremolo.xml



Musical notation for 23e-Tuplets-Tremolo.xml. The score is in 3/4 time and consists of two staves. The first staff contains a sequence of notes with triplet markings (3) above them. The second staff contains notes with sextuplet markings (6) above them. The piece concludes with a dynamic marking of *fp*.

Some " triplets" on the end of the first and in the second staff, using only <time-modification>, but not explicit tuplet bracket. Thus, the duration of the notes in the second staff should be scaled properly in comparison to staff 1, but no visual indication about the triplets is given.

23f-Tuplets-DurationButNoBracket.xml



Musical notation for 23f-Tuplets-DurationButNoBracket.xml. The score is in 4/4 time and consists of two staves. The first staff contains a sequence of notes. The second staff contains a sequence of notes, including a triplet of notes.

24 ... Grace notes

Different kinds of grace notes: acciaccatura, appoggiatura; beamed grace notes; grace notes with accidentals; different durations of the grace notes.

24a-GraceNotes.xml



Musical notation for 24a-GraceNotes.xml. The score is in common time and consists of a single staff. It features various types of grace notes, including acciaccaturas and appoggiaturas, some with beaming and accidentals.

Chords as grace notes.

24b-ChordAsGraceNote.xml



Musical notation for 24b-ChordAsGraceNote.xml. The score is in common time and consists of a single staff. It shows a chord used as a grace note.

A grace note that appears at the measure end (without any steal-from-* attribute set). Some applications need to convert this into an after-grace.

24c-GraceNote-MeasureEnd.xml



Musical notation for 24c-GraceNote-MeasureEnd.xml. The score is in 4/4 time and consists of a single staff. It shows a grace note appearing at the end of a measure.

Some grace notes and after-graces (indicated by steal-time-previous and steal-time-following).

24d-AfterGrace.xml



Musical notation for 24d-AfterGrace.xml. The score is in 4/4 time and consists of a single staff. It shows a grace note and an after-grace.

A grace note on a different staff than the actual note.

24e-GraceNote-StaffChange.xml



A grace note with a slur to the actual note. This can be interpreted as acciaccatura or appoggiatura, depending on the existence of a slash.

24f-GraceNote-Slur.xml



31 ... Dynamics and other single symbols

All <direction> elements defined in MusicXML. The lyrics for each note describes the direction element assigned to that note.

31a-Directions.xml

MusicXML directions (attached to staff)

The image displays three staves of musical notation illustrating various MusicXML direction symbols and their corresponding lyrics. Each note is accompanied by a direction symbol and a descriptive lyric.

Staff 1: Shows four notes with direction symbols **A**, **B**, **Test**, and **Crc** (circled). The lyrics below are: 1. reh.A (def=sq.) reh.B (none) reh.Test (sq.) reh.Crc (crc.)

Staff 2: Shows notes with direction symbols \emptyset and ∞ . The lyrics below are: Segno Coda Words Eyegl. p pp ppp pppp ppppp pppppp pppppp f ff

Staff 3: Shows notes with various dynamic and articulation symbols. The lyrics below are: fff fffff mp mf sf sfp sfpp fp rf rfz sfz sffz fz abc-ffz
ffff fffffff mp mf sf sfp sfpp fp rf rfz sfz sffz fz abc-ffz (oth.)

9 *tr*

hairpin cresc dash - es bra - cket oct. - shift *ped.* * *ped.* *

12 ♩ = 60

p subito ppp < fff

Metr. Harp ped. Damp Damp all Scord. Accordion reg. subp ppp crescto fff

Tempo Markings: note=bpm, text (note=bpm), note=note, (note=note), (note=bpm)
 31c-MetronomeMarks.xml

♩ = 100 **Adagio** (♩ = 100) (♩ = 77)

32 ... Notations and Articulations

All <notation> elements defined in MusicXML. The lyrics show the notation assigned to each note.

32a-Notations.xml

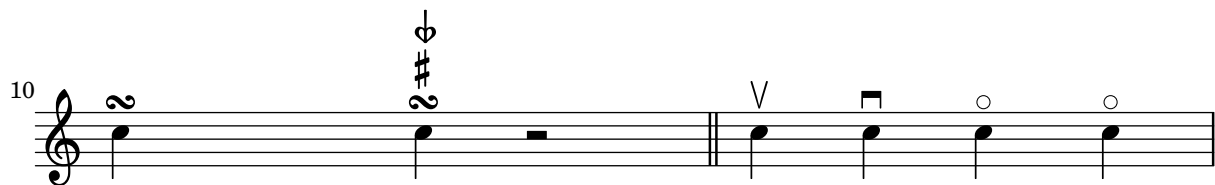
MusicXML notations (attached to note)

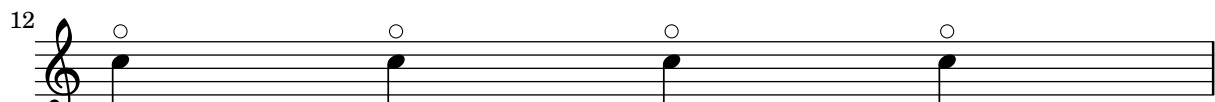
1. ferm. normal ferm. angled ferm. square ferm.

inv.ferm. arp. non-arp. acc.mark acc. str.-acc. stacc. ten.

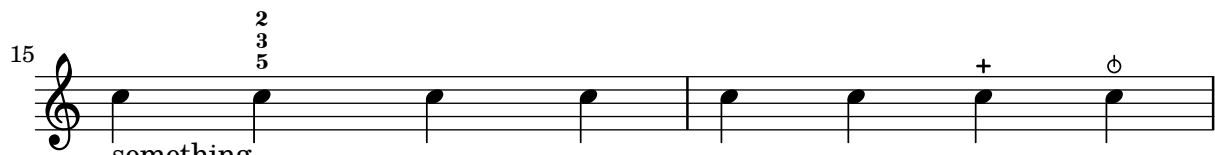
det.-leg. stacc.ss spicc. scoop plop doit falloff breath caes. stress unstr.


tr. turn del.turn inv.turn shake wavywavyline mord. inv.mord. schl. trem.

10  turn+acc. turn+acc.(ab.+bel./rel to turn) up-b. down-b. harm. nat.harm.


12  art.harm. nat.h./base nat.h./touching nat.h./sounding

13  open-str. thumb-pos. empty fing.1 fing.2 fing.3 fing.4 fing.5

15  something
fing.sth. mult.fing. empty pluck pluck a dbl.tng. trpl.tng. stopped snp.pizz.

17  empty fret fret0 empty str. str. 5 hammer - on pull - off

19  bend b.3 with-bar pre-b. -0.5 b. release 3.5 tap tap T heel toe

21  fingern. f ppp sfp sffz
f ppp sfp Oth.dyn. both above ab./bel./bel.

Text markup: different font sizes, weights and colors.

32b-Articulations-Texts.xml

Normal, Small
Normal, Large
Normal, Medium

Bold, Medium
Bold, Large

It should not make any difference whether two articulations are given inside two different notation elements, inside two different articulations children of the same notation element or

inside the same articulations element. Thus, all three notes should have a staccato and an accent.

32c-MultipleNotationChildren.xml



Different Arpeggio directions (normal, up, down, non-arpeggiate)

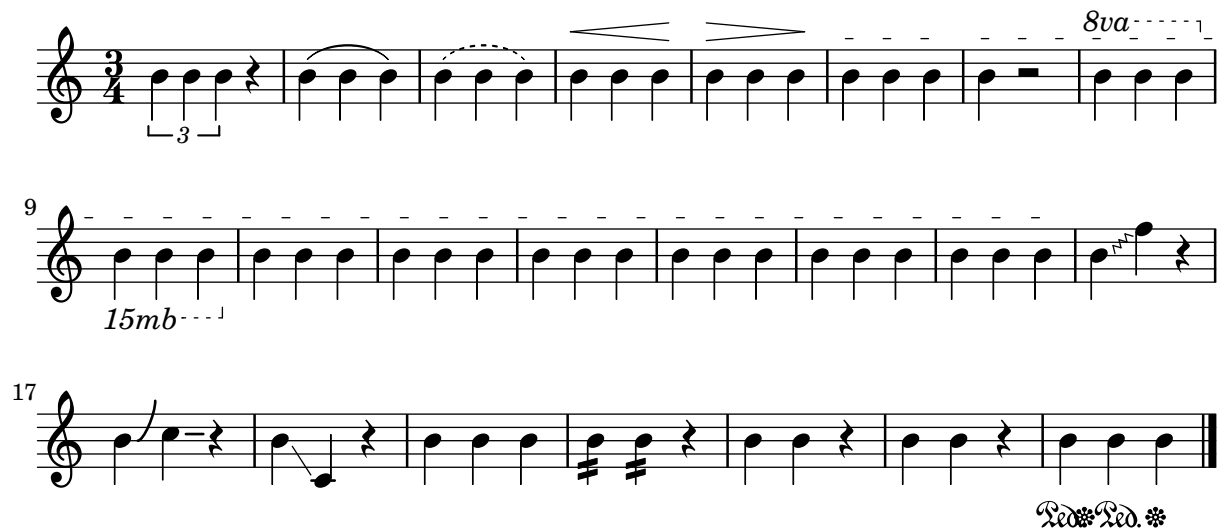
32d-Arpeggio.xml



33 ... Spanners

Several spanners defined in MusicXML: tuplet, slur (solid, dashed), tie, wedge (cresc, dim), tr + wavy-line, single-note trill spanner, octave-shift (8va,15mb), bracket (solid down/down, dashed down/down, solid none/down, dashed none/up, solid none/none), dashes, glissando (wavy), bend-alter, slide (solid), grouping, two-note tremolo, hammer-on, pull-off, pedal (down, change, up).

33a-Spanners.xml



Two simple tied whole notes

33b-Spanners-Tie.xml



A note can be the end of one slur and the start of a new slur. Also, in MusicXML, nested slurs are possible like in the second measure where one slur goes over all four notes, and another slur goes from the second to the third note.

33c-Spanners-Slurs.xml



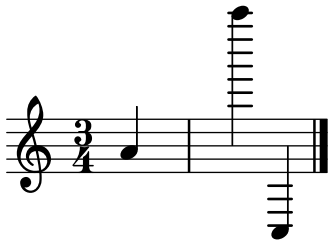
All types of octave shifts (15ma, 15mb, 8va, 8vb)

33d-Spanners-OctaveShifts.xml



Invalid octave-shifts: 27 down, 11 up.

33e-Spanners-OctaveShifts-InvalidSize.xml



A trill spanner that spans a grace note and ends on an after-grace note at the end of the measure.

33f-Trill-EndingOnGraceNote.xml



Slurs on chorded notes: Only the first note of the chord should get the slur notation. Some applications print out the slur for all notes – these should be ignored.

33g-Slur-ChordedNotes.xml

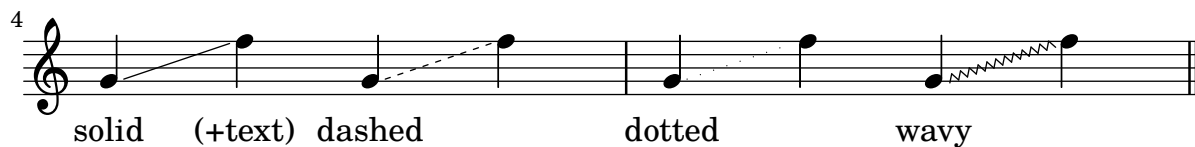


All different types of glissando defined in MusicXML

33h-Spanners-Glissando.xml

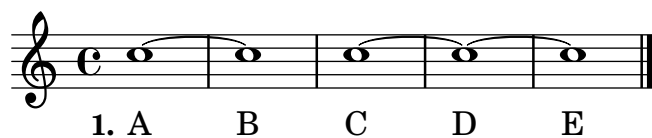


1. normal glissando solid (+text) dashed dotted wavy normal slide



Several ties that have their end tag missing.

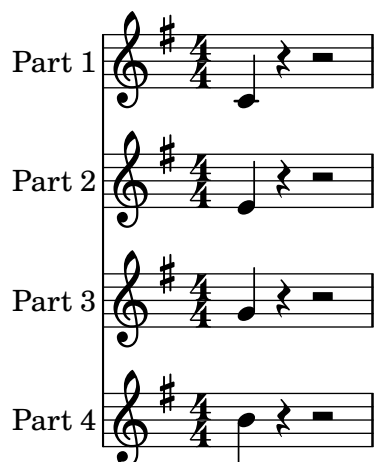
33i-Ties-NotEnded.xml



41 ... Multiple parts (staves)

A piece with four parts (P0, P1, P2, P3; different from what Finale creates!). Are they converted in the correct order?

41a-MultiParts-Partorder.xml



A piece with 20 parts to check whether an application supports that many parts and whether they are correctly sorted.

The image displays a vertical column of 20 musical staves, labeled P0 through P19. Each staff begins with a treble clef and a 4/4 time signature. The staves are arranged in a single column, with the labels P0, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, and P19 positioned to the left of each staff. The musical notation on the staves is not clearly visible, but the structure suggests a multi-part score with 20 individual parts.

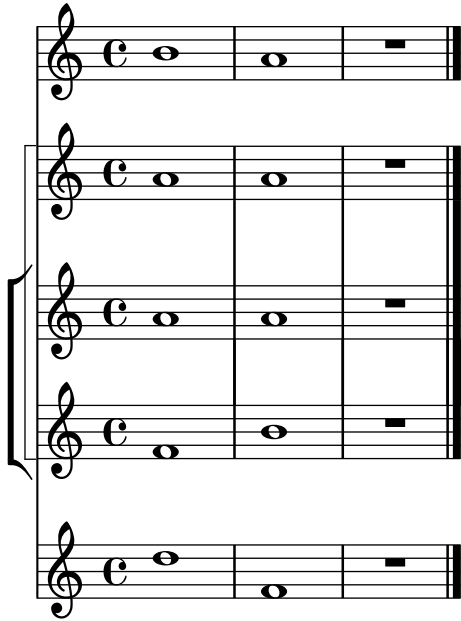
A huge orchestra score with 28 parts and different kinds of nested bracketed groups. Each part/group is assigned a name and an abbreviation to be shown before the staff. Also, most of the groups show unbroken barlines, while the barlines are broken between the groups.

The image shows a musical score for a full orchestra. The instruments are listed on the left, and their corresponding staves are on the right. The staves are grouped into two main sections: woodwinds and brass/strings. The woodwind section includes Piccolo, Flute 1, Flute 2, Oboe, Oboe through English Horn, Clarinet in Eb, Clarinet in Bb 1, Clarinet in Bb 2, Bass Clarinet, Bassoon 1, Bassoon 2, and Contrabassoon. The brass section includes Horn in F 1, Horn in F 2, Trumpet in C 1, Trumpet in C 2, Trombone 1, Trombone 2, and Tuba. The percussion section includes Timpani and Percussion. The string section includes Harp, Piano, Violin I, Violin II, Viola, Cello, and Contrabass. The score is written in a single system with a common time signature. The woodwind and brass parts are written in treble and bass clefs, while the string parts are written in treble and bass clefs. The percussion parts are written in a simplified notation. The woodwind and brass parts are grouped together with a curly bracket on the left, and the string parts are grouped together with a square bracket on the left. The woodwind and brass parts are further grouped into sub-sections with square brackets.

Piccolo
Flute 1
Flute 2
Oboe
Oboe through English Horn
Clarinet in Eb
Clarinet in Bb 1
Clarinet in Bb 2
Bass Clarinet
Bassoon 1
Bassoon 2
Contrabassoon
Horn in F 1
Horn in F 2
Trumpet in C 1
Trumpet in C 2
Trombone 1
Trombone 2
Tuba
Timpani
Percussion
Harp
Piano
Violin I
Violin II
Viola
Cello
Contrabass

Two properly nested part groups: One group (with a square bracket) goes from staff 2 to 4) and another group (with a curly bracket) goes from staff 3 to 4.

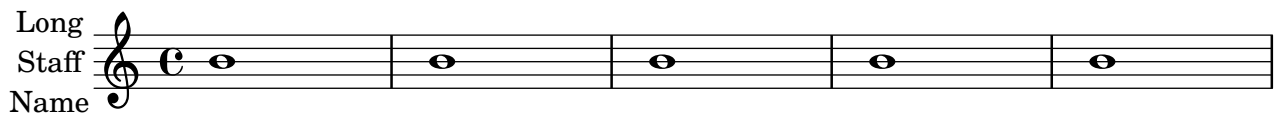
41d-StaffGroups-Nested.xml



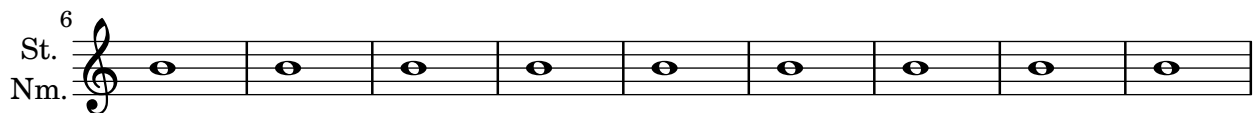
A musical score consisting of five staves. The first staff is a single treble clef staff. The second, third, and fourth staves are grouped together by a large left-facing curly bracket. The fifth staff is a single treble clef staff. Each staff contains three measures of music in common time (C), with a whole note in the first measure and a whole rest in the second and third measures.

Part names and abbreviations can contain line breaks.

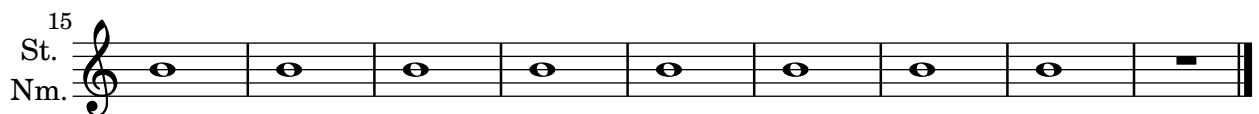
41e-StaffGroups-InstrumentNames-Linebroken.xml



A musical staff with a treble clef and common time signature. The staff contains five measures, each with a whole note. To the left of the staff, the text "Long Staff Name" is written vertically, with a line extending from the "S" of "Staff" across the entire length of the staff.



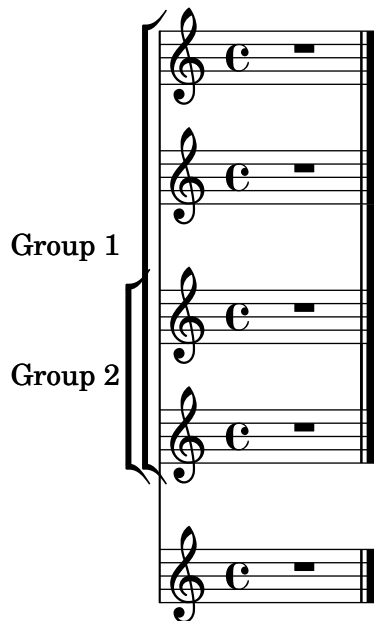
A musical staff with a treble clef and common time signature. The staff contains eight measures, each with a whole note. To the left of the staff, the text "St. Nm." is written vertically. A brace extends from the "6" above the staff across the first six measures.



A musical staff with a treble clef and common time signature. The staff contains eight measures, each with a whole note, followed by a whole rest in the final measure. To the left of the staff, the text "St. Nm." is written vertically. A brace extends from the "15" above the staff across the first seven measures.

MusicXML allows for overlapping part-groups, while many applications do not allow overlapping groups, but require them to be properly nested. In this case, one group (within parenthesis) goes from staff 1 to 4 and another group (also within parenthesis) goes from staff 3 to 5.

41f-StaffGroups-Overlapping.xml



A musical score consisting of five staves. The first two staves are grouped together by a bracket on the left labeled "Group 1". The next two staves are grouped together by a bracket on the left labeled "Group 2". The fifth staff is not grouped. Each staff contains a treble clef, a common time signature (C), and a whole rest.

A part with no id attribute. Since this piece has only one part, it is clear which part is described by the one part element.

41g-PartNoId.xml

This piece has more part elements than the part-list section gives. One can either convert all the parts present, but not listed in the part-list, or simply not import / ignore them.

41h-TooManyParts.xml

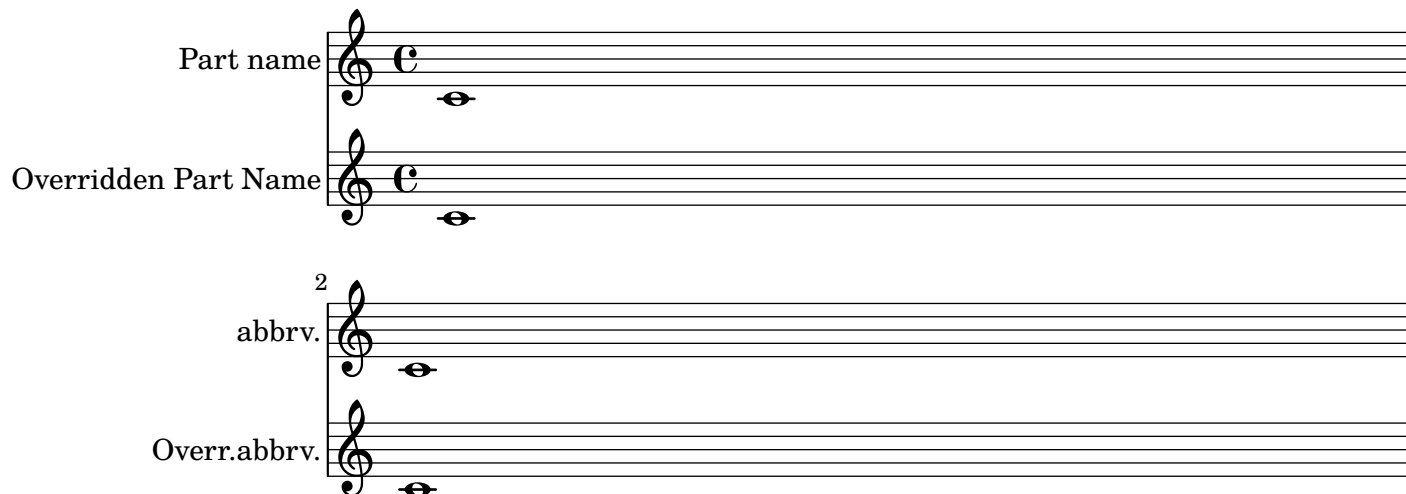


A single musical staff with a treble clef, a common time signature (C), and a whole rest.

MusicXML allows part-name and part-name-display in the score-part element. If part-name-display is given, it overrides the part-name for display.

The first staff uses only part-name, while the second one (same part-name) overrides it with a custom text. Similar for the part-abbreviation used in subsequent staves.

41i-PartNameDisplay-Override.xml



A musical score with four staves. The first staff is labeled "Part name" and contains a treble clef, a common time signature (C), and a whole rest. The second staff is labeled "Overridden Part Name" and contains a treble clef, a common time signature (C), and a whole rest. The third staff is labeled "abbrv." and contains a treble clef, a common time signature (C), and a whole rest. The fourth staff is labeled "Overrr.abbrv." and contains a treble clef, a common time signature (C), and a whole rest. A small number "2" is positioned above the third staff.

42 ... Multiple voices per staff

Two voices share one staff. Each voice is assigned some lyrics.

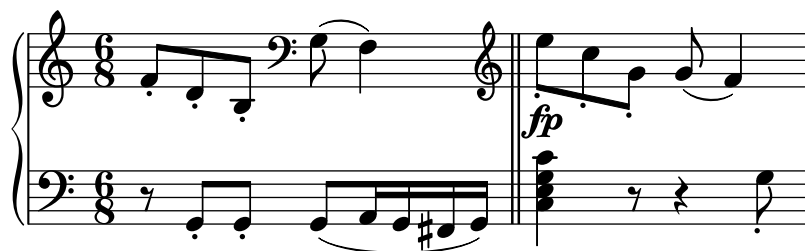
42a-MultiVoice-TwoVoicesOnStaff-Lyrics.xml



1. This is the lyrics of Voice1
1. This is the lyrics of Voice2

A multi-voice / multi-staff part with a clef change in the middle of a measure and a <backward> for voice 2 jumping back beyond that clef change.

42b-MultiVoice-MidMeasureClefChange.xml



43 ... One part on multiple staves

A simple piano staff

43a-PianoStaff.xml



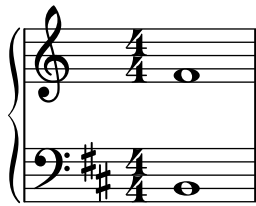
A piano staff with different keys and clefs for each of its staves. The keys and clefs for both staves are given at the very beginning of the measure.

43b-MultiStaff-DifferentKeys.xml



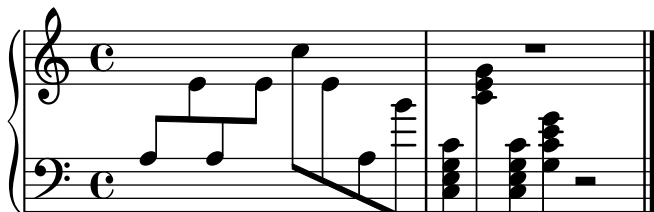
A piano staff with different keys and clefs for each of its staves. The key and clef for the second staff is given only after a backward, just before the first note of the second staff is given, but after the whole measure for staff 1 has been given.

43c-MultiStaff-DifferentKeysAfterBackup.xml



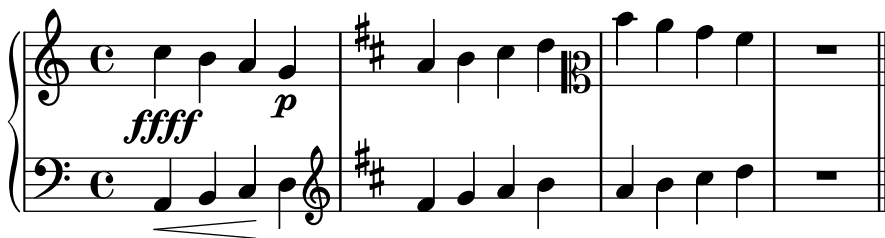
Staff changes in a piano staff. The voice from the second staff has some notes/chords on the first staff. The final two chords have some notes on the first, some on the second staff.

43d-MultiStaff-StaffChange.xml



A piano staff with dynamics and clef changes, where each element (ffff, wedge and clef changes) applies only to one voice or one staff, respectively.

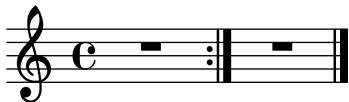
43e-Multistaff-ClefDynamics.xml



45 ... Repeats

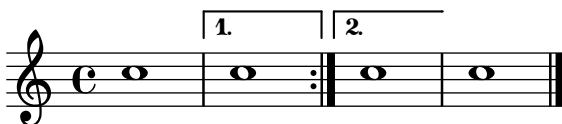
A simple, repeated measure (repeated 5 times)

45a-SimpleRepeat.xml



A simple repeat with two alternative endings (volta brackets).

45b-RepeatWithAlternatives.xml



Repeats can also be nested.

45c-RepeatMultipleTimes.xml



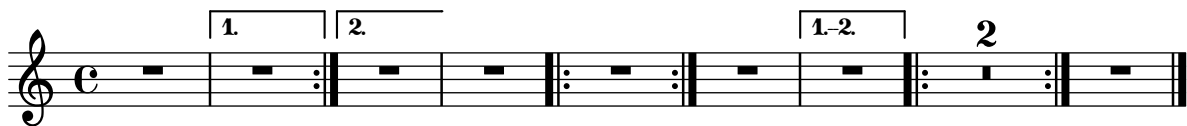
Nested repeats, each with alternative endings.

45d-Repeats-Nested-Alternatives.xml



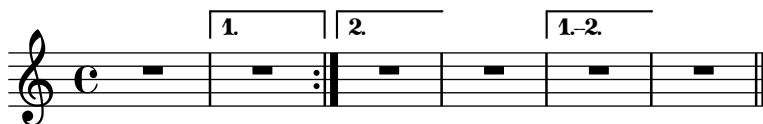
Some more nested repeats with alternatives. The barline between measure 7 and 8 will probably be messed up! (Should be a repeat on both sides!)

45e-Repeats-Nested-Alternatives.xml



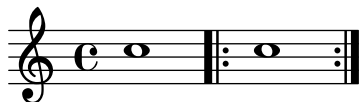
Some more nested repeats with alternatives, where the MusicXML file does not make sense in the first place. How well are applications able to cope with improper repeats and alternatives?

45f-Repeats-InvalidEndings.xml



A forward-repeating bar line without an ending repeat bar.

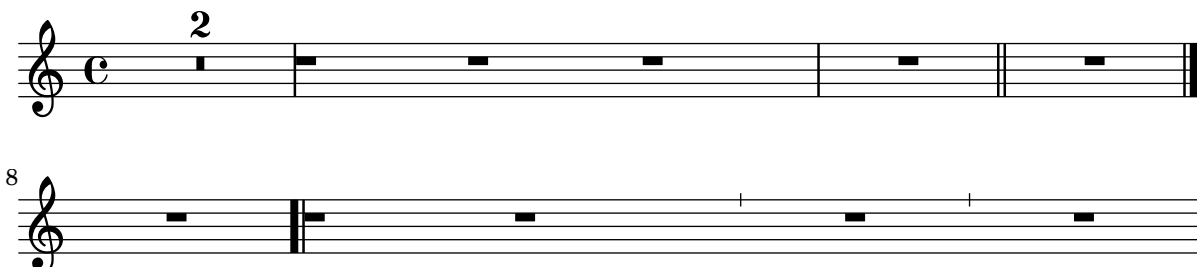
45g-Repeats-NotEnded.xml



46 ... Barlines, Measures

Different types of (non-repeat) barlines: default (no setting), regular, dotted, dashed, heavy, light-light, light-heavy, heavy-light, heavy-heavy, tick, short, none.

46a-Barlines.xml



Barlines can appear at mid-measure positions, without using an implicit measure!

46b-MidmeasureBarline.xml



A clef change in the middle of a measure, using either an implicit measure or simply placing the attributes in the middle of the measure.

46c-Midmeasure-Clef.xml



A 3/8 pickup measure, a measure that is split into one (incomplete, only 2/4) measure and an implicit measure, and an incomplete measure (containing 3/4).

46d-PickupMeasure-ImplicitMeasures.xml



Voice 2 should start at 2nd beat of first full measure.

46e-PickupMeasure-SecondVoiceStartsLater.xml



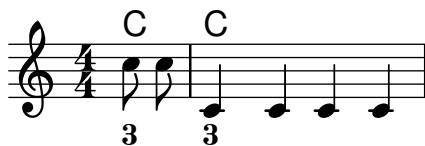
Measures can contain less notes than the time signature says. Here, the first and third measures contain only two quarters instead of four.

46f-IncompleteMeasures.xml



Pickup measure with chord names and figured bass.

46g-PickupMeasure-Chordnames-FiguredBass.xml



51 ... Header information

Several header fields and part names can contain quotes ("). This test checks whether they are converted/imported without problems (i.e. whether they are correctly escaped when converting).

51b-Header-Quotes.xml

" Quotes" in header fields

Some " Tester" Name



There can be multiple <rights> tags in the identification element of the score. The conversion shall still work, ideally using both of them.

51c-MultipleRights.xml



A piece with an empty (but existing) work-title, but a non-empty movement-title. In this case the movement-title should be chosen, even though the work-title exists.

51d-EmptyTitle.xml

Empty work-title, non-empty movement-title

Empty work-title, non-empty movement-title

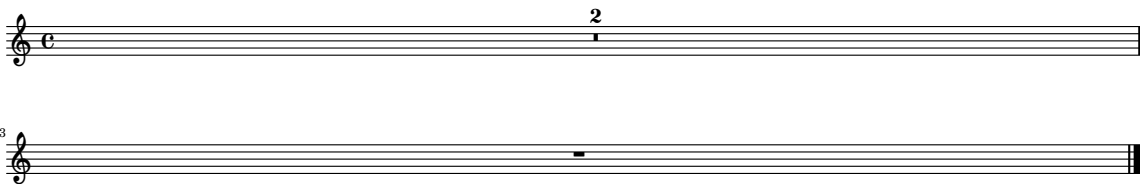


52 ... Page layout

Several page layout settings: paper size, margins, system margins and distances, different fonts, etc.

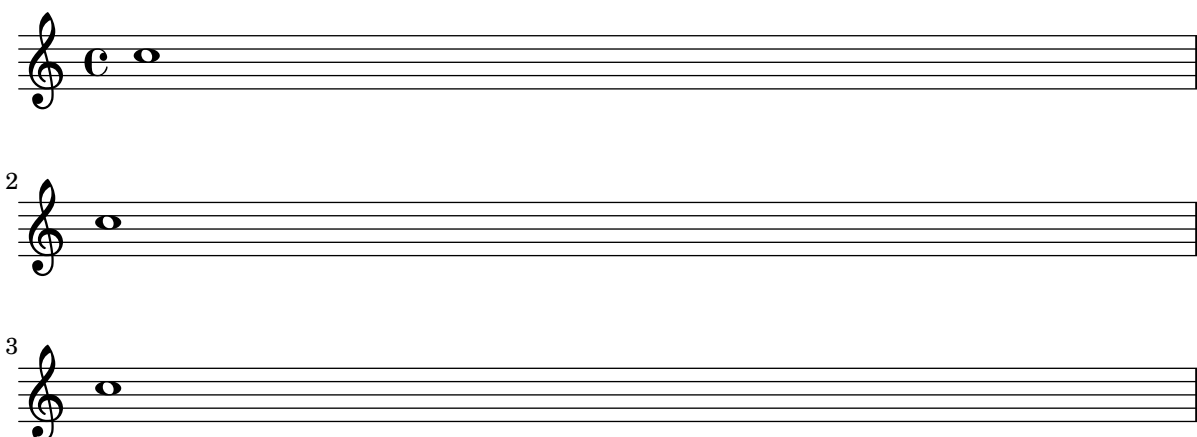
52a-PageLayout.xml

Layout options



System and page breaks, given in a <print> element

52b-Breaks.xml



61 ... Lyrics

Some notes with simple lyrics: Syllables, notes without a syllable, syllable spanners.

61a-Lyrics.xml



1. Trala-li Ja! Tra - ra! Bah!

Multiple (simple) lyrics. The order of the exported stanzas is relevant (identified by the number attribute in this test case)

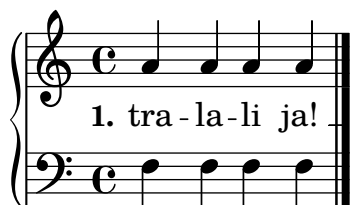
61b-MultipleLyrics.xml



1. 1.Tra-la-la, ja! — Tra - ra...
2. 2.tra - la-la, ja! — Tra - ra.
3. 3.TRALALA, JA! — TRA-RA...

Lyrics assigned to the voices of a piano staff containing two simple staves. Each staff is assigned exactly one lyrics line.

61c-Lyrics-Pianostaff.xml



1. TRALALI JA! _

How to treat lyrics and slurred notes. Normally, a slurred group of notes is assigned only one lyrics syllable.

61d-Lyrics-Melisma.xml



1. Me - lis - ma. _

Assigning lyrics to chorded notes.

61e-Lyrics-Chords.xml



1. Lyrics on chords

Grace notes shall not mess up the lyrics, and they shall not be assigned a syllable.

61f-Lyrics-GracedNotes.xml




1. Ly - rics on notes _

The image shows a musical staff in treble clef with a common time signature (C). It contains a sequence of notes: a quarter note, a quarter note with a grace note, a quarter note, a quarter note, a quarter note, a quarter note, a quarter note, and a quarter note. The lyrics "1. Ly - rics on notes _" are aligned with the notes.

A lyrics syllable can have both a number and a name attribute. The question is: What should be used to put syllables of the same voice together. This example uses different number/name combinations to check how different applications handle this unspecified case (The advice on the MusicXML mailing list was "there is no correct way, each application can do what it thinks is best").

61g-Lyrics-NameNumber.xml



1. Verse1AChorus1AAnotherChorus1A1BVerse1CChorus1D
2. Chorus1A - 2B - Chorus2C
3. VerseE
4. NoneF

The image shows a musical staff in treble clef with a 6/4 time signature. It contains a sequence of six quarter notes. The lyrics are listed below the staff, with some syllables aligned with the notes.

Beaming or slurs can indicate melismata for lyrics. Also make sure that notes without an explicit syllable are treated as if they were part of a melisma.

61h-Lyrics-BeamsMelismata.xml



1. Me - lisma _ Me - lisma _ Me - lisma _ Me - lisma _

The image shows a musical staff in treble clef with a common time signature (C). It contains a sequence of notes with beams and slurs, indicating melismata. The lyrics "1. Me - lisma _ Me - lisma _ Me - lisma _ Me - lisma _" are aligned with the notes.

Each note of a chord can have some lyrics attached. In this case, each note of the chord has lyrics of the form "Lyrics [123]" attached, where each lyrics has a different number attribute to distinguish them. These syllables should be imported into three different stanzas and the timing should be correct.

61i-Lyrics-Chords.xml



1. Lyrics 1
2.
3.

The image shows a musical staff in treble clef with a common time signature (C). It contains a single chord. The lyrics "1. Lyrics 1", "2.", and "3." are listed below the staff.

Multiple lyrics syllables assigned to a single note are implemented either using a space in the lyrics or by using the <elision> lyrics element. This testcase checks both of them. First, a note with one syllable is given, then a note with two syllables separated by a space and finally a note with two and one with three syllables implemented using <elision> is given.

61j-Lyrics-Elisions.xml



1. a b c d e f g h

The image shows a musical staff in treble clef with a common time signature (C). It contains a sequence of eight quarter notes. The lyrics "1. a b c d e f g h" are aligned with the notes.

Lyrics spanners: continued syllables and extenders, possibly spanning multiple notes. The intermediate notes do not have any <lyric> element.

61k-Lyrics-SpannersExtenders.xml

A musical staff in treble clef with a common time signature (C). The melody consists of quarter notes: A, B, C, C, D, E. A lyric line below the staff reads: "1. A _ b - CC _ e _". The notes are aligned with the syllables: A under A, B under b, C under C, C under C, D under CC, and E under e. The final note E has a fermata.

71 ... Guitar notation

A normal staff with several (complex) chord names displayed.

71a-Chordnames.xml

A musical staff in treble clef with a common time signature (C). The melody consists of quarter notes: C, D, E, F, G, A, B, C. Above the staff, chord names are written: C, C^{lyd}, B⁷ #5 #9, E^b sus2, G, D[#], A⁰⁷, A^{#5}. The notes are aligned with the chord names: C under C, D under C^{lyd}, E under B⁷ #5 #9, F under E^b sus2, G under G, A under D[#], B under A⁰⁷, and C under A^{#5}.

A staff with chord names and some fretboards shown. The fretboards can have an arbitrary number of frets/strings, can start at an arbitrary fret and can even contain fingering information.

71c-ChordsFrets.xml

A musical staff in treble clef with a common time signature (C). The melody consists of quarter notes: C, D, E, F, G, A, B, C. Above the staff, chord names are written: C, C^{lyd}, B⁷ #5 #9, E^b sus2, G, D[#], A⁰⁷, C. Below the staff, fretboard diagrams are shown for each chord: C (open), C^{lyd} (open), B⁷ #5 #9 (fret ii), E^b sus2 (fret xi), G (open), D[#] (fret iii), A⁰⁷ (fret 7), and C (open). The fretboard diagrams show the string and fret positions for each chord.

Chords and fretboards assigned to the voices in a multi-voice, multi-staff part. There should be fret diagrams above each of the two staves.

71d-ChordsFrets-Multistaff.xml

A multi-staff musical score with two staves. The top staff is in treble clef and the bottom staff is in bass clef. Both staves have a common time signature (C). The melody consists of quarter notes: C, D, E, F, G, A, B, C. Above the top staff, chord names are written: E^bm⁹, C, D⁷, C^m7¹¹. Below the top staff, fretboard diagrams are shown for each chord: E^bm⁹ (fret iv), C (open), D⁷ (open), and C^m7¹¹ (fret 11). The fretboard diagrams show the string and fret positions for each chord.

Some tablature staves, with explicit fingering information and different string tunings given in the MusicXML file.

71e-TabStaves.xml

All chord types defined in MusicXML. The staff will only contain one c' note (NO chord) for all of them, but the chord names should be properly printed.

71f-AllChordTypes.xml

All MusicXML chord names/types with <root>

1. major minor augmented diminished

2. dominant major-seventh minor-seventh diminished-seventh

3 $C^{7\#5}$ $C^{7\flat5}$ Cm^{Δ} C^6
 augmented-seventh half-diminished major-minor major-sixth

4 Cm^6 C^9 $C^{\Delta 9}$ Cm^9
 minor-sixth dominant-ninth major-ninth minor-ninth

5 C^{11} $C^{\Delta 11}$ Cm^{11} C^{13}
 dominant-11th major-11th minor-11th dominant-13th

6 $C^{\Delta 13}$ Cm^{13} C^{sus2} C^{sus4}
 major-13th minor-13th suspended-second suspended-fourth

7 C^5 C
 Neapolitan Italians French German pedal power Tristan other

9 $F^{\#5}$ $F^{\flat5}/C$ $G^{\#5}/D^{\#}$ C^5 $C^{\flat5}$ $G^{sus\flat2}$
 Inversion F^{\flat}/C $G^{\#}/D^{\#}$ C $C-3+5b$

There can be multiple subsequent harmony elements, indicating a harmony change during a note

71g-MultipleChordnames.xml

C $F^{\#m6}$ Dm^7 G^7

72 ... Transposing instruments

Transposing instruments: Trumpet in B \flat , Horn in E \flat , Piano; All of them show the C major scale (the trumpet with 2 sharp, the horn with 3 sharp).

72a-TransposingInstruments.xml

The image shows a musical score with three staves. The top staff is labeled 'Trumpet in Bb' and has a key signature of two sharps (F# and C#) and a common time signature (C). The middle staff is labeled 'Horn in Eb' and has a key signature of three sharps (F#, C#, and G#) and a common time signature (C). The bottom staff is labeled 'Piano' and has a common time signature (C). All three staves contain a sequence of notes: a quarter note on the first line (C), followed by quarter notes on the second line (D), second space (E), third space (F), and third line (G), and finally a quarter note on the fourth line (A). The notes are written in a way that illustrates transposition: the Trumpet part starts on C4, the Horn part starts on C5, and the Piano part starts on C4.

Various transposition. Each part plays a c'' , just displayed in different display pitches. The second-to-last staff uses a transposition where the displayed c' is an actual f''' concert pitch. The final staff is an untransposed instrument.

72b-TransposingInstruments-Full.xml

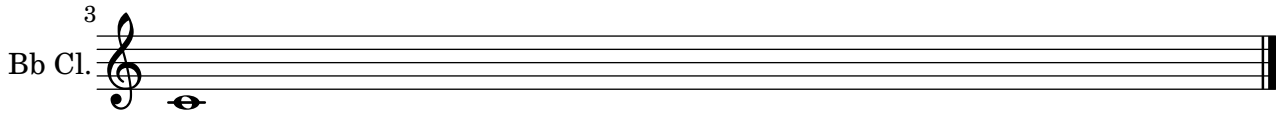
The image shows a musical score for ten different instruments, each on a separate staff. The instruments and their transpositions are: Clarinet in Eb, Clarinet in Bb, Clarinet in A, Horn in F, Horn in Eb, Piccolo Trumpet in A, Trumpet in Bb, Trumpet in C, Trumpet in D, and a staff labeled 'displayed c'=fis''' with an '8' below it. Each staff contains a single note (a half note) in a specific key signature, with a double bar line at the end of the staff. The key signatures vary: Eb (three flats), Bb (two flats), A (one flat), F (one flat), Eb (three flats), A (one flat), Bb (two flats), C (one sharp), D (one flat), and Fis (one sharp).

An instrument change from one transposition (Clarinet in Eb) to another transposing instrument (Clarinet in Bb). The displayed instrument name should also be updated.

The whole piece is in Bb major (sounding), so first the key signature should be one flat, after the change it should have no accidentals.

72c-TransposingInstruments-Change.xml

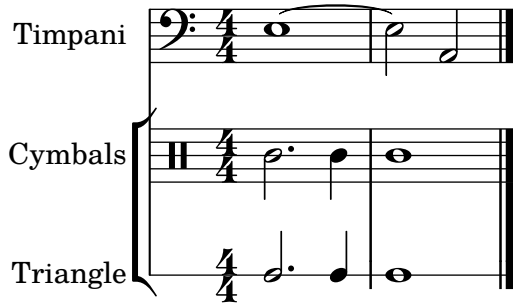
The image shows a musical score for a Clarinet in Eb. The staff is in treble clef and contains two measures. The first measure has a key signature of one sharp (F#) and a half note. The second measure has a key signature of one flat (Bb) and a half note. A double bar line is present between the two measures.



73 ... Percussion

Three types of percussion staves: A five-line staff with bass clef for Timpani, a five-line staff with percussion clef, and a one-line percussion staff with only unpitched notes.

73a-Percussion.xml



74 ... Figured bass

Some figured bass containing altered figures, bracketed figures and slashed figures. The last note contains an empty <figured-bass> element, which is invalid MusicXML, to check how well applications cope with malformed files.

Note that this file does not contain any extenders!

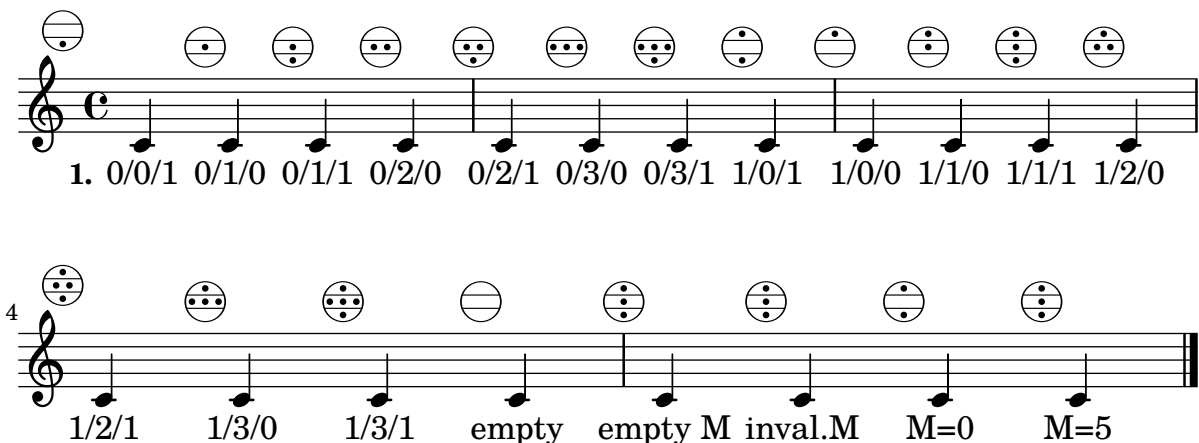
74a-FiguredBass.xml



75 ... Other instrumental notation

All possible accordion registrations.

75a-AccordionRegistrations.xml



90 ... Compressed MusicXML files

A compressed MusicXML file, containing a simple MusicXML score and the corresponding .pdf output for reference.

90a-Compressed-MusicXML.mxl

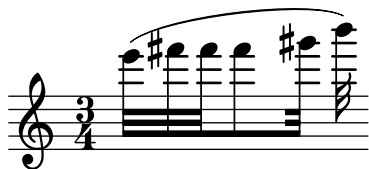
Compressed MusicXML file



99 ... Compatibility with broken MusicXML

Dolet 3 for Sibelius (5.1) did not print out any closing beam tags, only starting and continuing beam tags. For such files, one either needs to ignore all beaming information or close all beams

99a-Sibelius5-IgnoreBeaming.xml



If we properly ignore all beaming information from the Dolet 3 for Sibelius export file, make sure that the lyrics syllables are still assigned to the correct notes.

99b-Lyrics-BeamsMelismata-IgnoreBeams.xml



1. Me - lisma ___ Me - lisma ___ Me - lisma ___ Me - lisma ___

A musical staff in treble clef with a common time signature (C). The melody consists of a series of eighth notes beamed together, with a long horizontal line above the notes indicating the duration of the melisma. The lyrics are written below the staff, aligned with the notes.