

# 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 2.21.0. 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 with cautionary accidentals and ends 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.

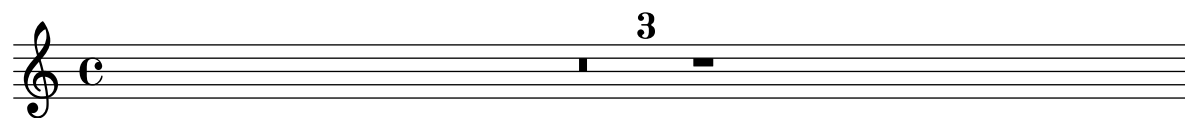
01f-Pitches-ParenthesizedMicrotoneAccidentals.xml

## 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



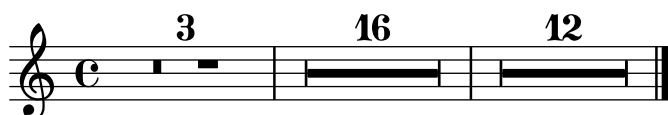
Rests can have explicit pitches, where they are displayed. The first rest uses no explicit position and should use the default position, all others are explicitly positioned somewhere else.

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

Three staves of musical notation illustrating rhythmic durations. The first staff (measures 16-24) shows a sequence of notes with durations: a whole note, a half note, a quarter note, an eighth note, a sixteenth note, a thirty-second note, a sixty-fourth note, and a one-hundred-twenty-eighth note. The second staff (measures 3-28) shows a sequence of notes with durations: a whole note, a half note, a quarter note, an eighth note, a sixteenth note, a thirty-second note, a sixty-fourth note, and a one-hundred-twenty-eighth note. The third staff (measures 5-28) shows a sequence of notes with durations: a whole note, a half note, a quarter note, an eighth note, a sixteenth note, a thirty-second note, a sixty-fourth note, and a one-hundred-twenty-eighth note.

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

A single staff of musical notation showing a backup in common time. The first half of the measure contains a quarter note, and the second half contains a quarter note.

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.

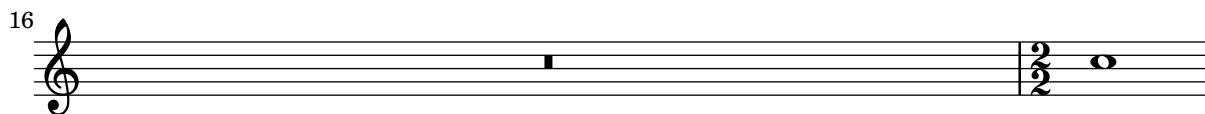
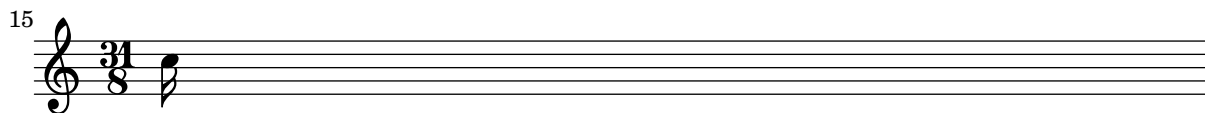
03c-Rhythm-DivisionChange.xml

A single staff of musical notation showing a division change in common time. The first half of the measure uses a division of 1, and the second half uses a division of 8.

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

Two staves of musical notation showing durations that cannot be expressed with dotted notes. The first staff (measures 1-5) shows a sequence of notes with durations: a quarter note, a half note, a three-quarter note, a whole note, and a five-quarter note. The second staff (measures 9-14) shows a sequence of notes with durations: a quarter note, a half note, a three-quarter note, a whole note, and a five-quarter note.



## 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



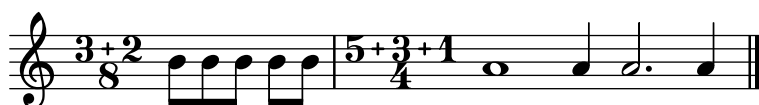
A score without a time signature (but with a key and clefs)

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

Musical notation on a single staff showing a sequence of measures with various clefs. Measure 1: Treble clef, common time, quarter note. Measure 2: Bass clef, common time, quarter note. Measure 3: Bass clef, common time, quarter note. Measure 4: No clef, common time, quarter note. Measure 5: Treble clef, common time, quarter note. Measure 6: Bass clef, common time, quarter note. Measure 7: Bass clef, common time, quarter note. Measure 8: No clef, common time, quarter note. Measure 9: Bass clef, common time, quarter note. Measure 10: Bass clef, common time, quarter note. Measure 11: Bass clef, common time, quarter note. Measure 12: Bass clef, common time, quarter note. Measure 13: Bass clef, common time, quarter note. Measure 14: Bass clef, common time, quarter note. Measure 15: Bass clef, common time, quarter note. Measure 16: Bass clef, common time, quarter note. Measure 17: No clef, common time, quarter note. Measure 18: Treble clef, common time, quarter note. Measure 19: Treble clef, common time, quarter note. Measure 20: Treble clef, common time, quarter note. Measure 21: Treble clef, common time, quarter note. Measure 22: Treble clef, common time, quarter note. Measure 23: Treble clef, common time, quarter note. Measure 24: Treble clef, common time, quarter note. Measure 25: Treble clef, common time, quarter note. Measure 26: Treble clef, common time, quarter note. Measure 27: Treble clef, common time, quarter note. Measure 28: Treble clef, common time, quarter note. Measure 29: Treble clef, common time, quarter note. Measure 30: Treble clef, common time, quarter note. Measure 31: Treble clef, common time, quarter note. Measure 32: Treble clef, common time, quarter note. Measure 33: Treble clef, common time, quarter note. Measure 34: Treble clef, common time, quarter note. Measure 35: Treble clef, common time, quarter note. Measure 36: Treble clef, common time, quarter note. Measure 37: Treble clef, common time, quarter note. Measure 38: Treble clef, common time, quarter note. Measure 39: Treble clef, common time, quarter note. Measure 40: Treble clef, common time, quarter note. Measure 41: Treble clef, common time, quarter note. Measure 42: Treble clef, common time, quarter note. Measure 43: Treble clef, common time, quarter note. Measure 44: Treble clef, common time, quarter note. Measure 45: Treble clef, common time, quarter note. Measure 46: Treble clef, common time, quarter note. Measure 47: Treble clef, common time, quarter note. Measure 48: Treble clef, common time, quarter note. Measure 49: Treble clef, common time, quarter note. Measure 50: Treble clef, common time, quarter note. Measure 51: Treble clef, common time, quarter note. Measure 52: Treble clef, common time, quarter note. Measure 53: Treble clef, common time, quarter note. Measure 54: Treble clef, common time, quarter note. Measure 55: Treble clef, common time, quarter note. Measure 56: Treble clef, common time, quarter note. Measure 57: Treble clef, common time, quarter note. Measure 58: Treble clef, common time, quarter note. Measure 59: Treble clef, common time, quarter note. Measure 60: Treble clef, common time, quarter note. Measure 61: Treble clef, common time, quarter note. Measure 62: Treble clef, common time, quarter note. Measure 63: Treble clef, common time, quarter note. Measure 64: Treble clef, common time, quarter note. Measure 65: Treble clef, common time, quarter note. Measure 66: Treble clef, common time, quarter note. Measure 67: Treble clef, common time, quarter note. Measure 68: Treble clef, common time, quarter note. Measure 69: Treble clef, common time, quarter note. Measure 70: Treble clef, common time, quarter note. Measure 71: Treble clef, common time, quarter note. Measure 72: Treble clef, common time, quarter note. Measure 73: Treble clef, common time, quarter note. Measure 74: Treble clef, common time, quarter note. Measure 75: Treble clef, common time, quarter note. Measure 76: Treble clef, common time, quarter note. Measure 77: Treble clef, common time, quarter note. Measure 78: Treble clef, common time, quarter note. Measure 79: Treble clef, common time, quarter note. Measure 80: Treble clef, common time, quarter note. Measure 81: Treble clef, common time, quarter note. Measure 82: Treble clef, common time, quarter note. Measure 83: Treble clef, common time, quarter note. Measure 84: Treble clef, common time, quarter note. Measure 85: Treble clef, common time, quarter note. Measure 86: Treble clef, common time, quarter note. Measure 87: Treble clef, common time, quarter note. Measure 88: Treble clef, common time, quarter note. Measure 89: Treble clef, common time, quarter note. Measure 90: Treble clef, common time, quarter note. Measure 91: Treble clef, common time, quarter note. Measure 92: Treble clef, common time, quarter note. Measure 93: Treble clef, common time, quarter note. Measure 94: Treble clef, common time, quarter note. Measure 95: Treble clef, common time, quarter note. Measure 96: Treble clef, common time, quarter note. Measure 97: Treble clef, common time, quarter note. Measure 98: Treble clef, common time, quarter note. Measure 99: Treble clef, common time, quarter note. Measure 100: Treble clef, common time, quarter note. The piece ends with a double bar line.

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 11 staves of musical notation, each representing a different key signature. The notation is in treble clef and 2/4 time. Each staff begins with a key signature change (flats or sharps) and is followed by a sequence of notes. 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. The notes in each staff are: G (11 flats), A (10 flats), B (9 flats), C (8 flats), D (7 flats), E (6 flats), F (5 flats), G (4 sharps), A (5 sharps), B (6 sharps), C (7 sharps), D (8 sharps), E (9 sharps), F (10 sharps), G (11 sharps).

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

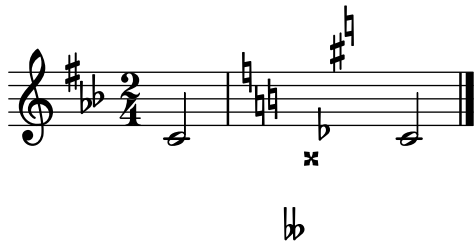
13b-KeySignatures-ChurchModes.xml

The image shows a single staff of musical notation in treble clef and common time (C). The key signature has two sharps (F# and C#). The notes are: C# (major), D# (minor), E# (ionian), F# (dorian), G# (phrygian), A# (lydian), B# (mixolydian), C# (aeolian), D# (locrian).

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).

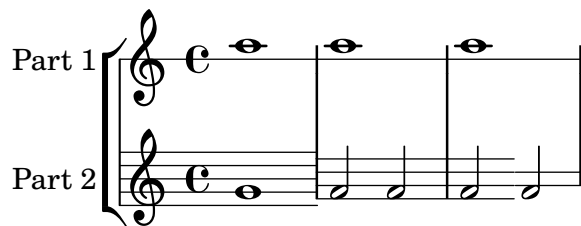
13d-KeySignatures-Microtones.xml



## 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



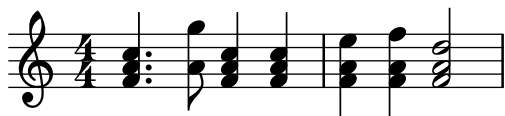
Some subsequent (identical) two-note chords.

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



23e-Tuplets-Tremolo.xml



A musical score in 3/4 time, consisting of two staves. The first staff contains three groups of eighth notes, each marked with a '3' above it, indicating triplets. The second staff contains six groups of notes, with markings '3', '3', '3', '6', '3', '3' above them, indicating triplets and sextuplets. The piece concludes with a double bar line and the dynamic marking *fp* (fortissimo piano).

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



A musical score in 4/4 time, consisting of two staves. The first staff contains a sequence of quarter notes. The second staff contains a sequence of eighth notes, with a triplet of eighth notes at the end of the piece.

## 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



A musical score in common time (C), consisting of a single staff. It features various types of grace notes: acciaccaturas (short grace notes), appoggiaturas (long grace notes), and beamed grace notes.

Chords as grace notes.

24b-ChordAsGraceNote.xml



A musical score in common time (C), consisting of a single staff. It shows a chord used as a grace note, indicated by a vertical line connecting the notes to the main 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



A musical score in 4/4 time, consisting of a single staff. It shows a grace note appearing at the end of a measure, indicated by a vertical line connecting it to the note in the following measure.

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

24d-AfterGrace.xml



A musical score in 4/4 time, consisting of a single staff. It shows a grace note and an after-grace, indicated by vertical lines connecting them to the notes in the previous and following measures.

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)

A musical staff in common time with a treble clef. The staff contains four notes, each with a different direction symbol above it: a box containing 'A', a box containing 'B', a box containing 'Test', and a circle containing 'Crc'. Below the staff, the following text is written: 1. reh.A (def=sq.) reh.B (none) reh.Test (sq.) reh.Crc (crc.)

A musical staff in common time with a treble clef. The staff contains a series of notes with various dynamic and direction symbols above them: a symbol resembling a crossed-out 'S', a symbol resembling a crossed-out 'O', and a symbol resembling a crossed-out 'C'. Below the staff, the following text is written: 2. Segno Coda Words Eyegl. p pp ppp pppp ppppp pppppp pppppp f ff

A musical staff in common time with a treble clef. The staff contains a series of notes with various dynamic and direction symbols above them: fff, fffff, mp, mf, sf, sfp, sfpp, fp, rf, rfz, sfz, sffz, fz, abc-ffz. Below the staff, the following text is written: 5. fff fffff fffff fffff mp mf sf sfp sfpp fp rf rfz sfz sffz fz abc-ffz (oth.)



9 *tr*

hairpin cresc dash - es bra - cket oct. - shift pedal change - mark

12 ♩ = 60

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

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

Adagio

### 32 ... Notations and Articulations

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

32a-Notations.xml

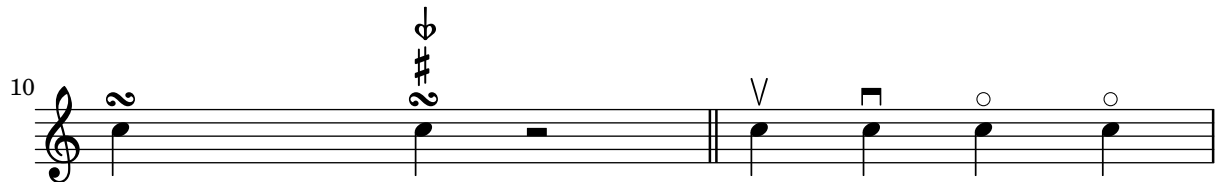
#### MusicXML notations (attached to note)

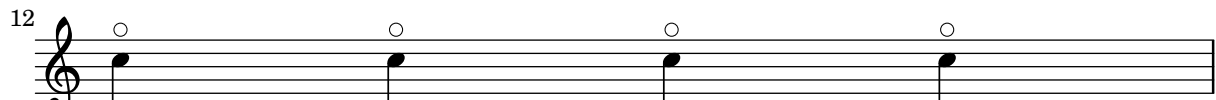
1. ferm. normal ferm. angled ferm. square ferm.

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 wavy wavyline 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

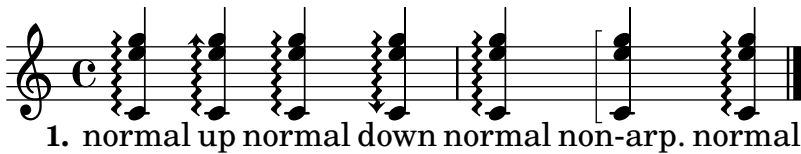
inside the same articulations element. Thus, all three notes should have a staccato and an accent.

32c-MultipleNotationChildren.xml



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

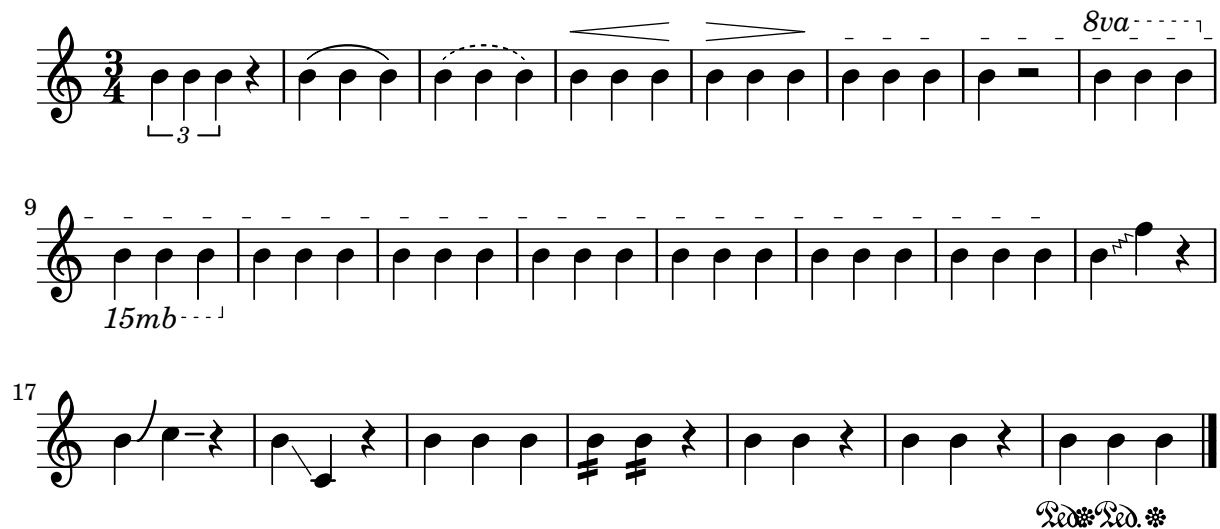
32d-Arpeggio.xml



### 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



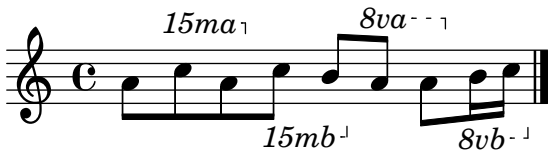
A note can be the end of one slur and the start of a new slur. Also, in MusicXML, nested slurs are possible like in the second measure where one slur goes over all four notes, and another slur goes from the second to the third note.

33c-Spanners-Slurs.xml



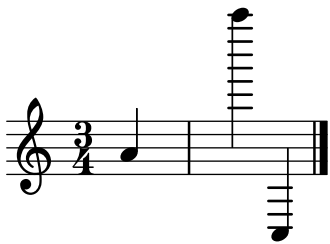
All types of octave shifts (15ma, 15mb, 8va, 8vb)

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

4

solid (+text) dashed dotted wavy

A musical staff with a treble clef and a key signature of one sharp (F#). It contains four measures of music, each illustrating a different type of tie between notes. The first measure shows a solid tie. The second measure shows a tie with the text "(+text)" above it. The third measure shows a dashed tie. The fourth measure shows a wavy tie. The notes are on the G line (G4) and the A space (A4).

Several ties that have their end tag missing.

33i-Ties-NotEnded.xml

1. A B C D E

A musical staff with a treble clef and a common time signature (C). It contains five measures of music, each with a single note tied to the next. The notes are on the G line (G4) and the A space (A4). The notes are labeled A, B, C, D, and E below the staff.

## 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

Part 1  
Part 2  
Part 3  
Part 4

A musical score with four staves, labeled Part 1, Part 2, Part 3, and Part 4. Each staff has a treble clef, a key signature of one sharp (F#), and a 4/4 time signature. Each staff contains a single note on the G line (G4) followed by a rest for the remainder of the measure.

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

P0  
P1  
P2  
P3  
P4  
P5  
P6  
P7  
P8  
P9  
P10  
P11  
P12  
P13  
P14  
P15  
P16  
P17  
P18  
P19

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 square bracket, and the string parts are grouped together with a curly bracket.

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 a treble clef, a common time signature 'C', and three measures of music. Each measure contains a single quarter note, with the pitch increasing by one step in each successive measure. The notes are: C4, D4, E4, F4, G4, A4, B4, C5. The first measure of each staff contains the first note, the second measure contains the second note, and the third measure contains the third note. The fourth measure of each staff contains a whole rest. The score ends with a double bar line.

Part names and abbreviations can contain line breaks.

41e-StaffGroups-InstrumentNames-Linebroken.xml

A musical staff with a treble clef and a common time signature 'C'. The staff contains five measures of music, each with a single quarter note. The notes are: C4, D4, E4, F4, G4. The staff is labeled on the left with the text 'Long Staff Name' stacked vertically, with a line extending from the 'S' in 'Staff' to the first measure of the staff.

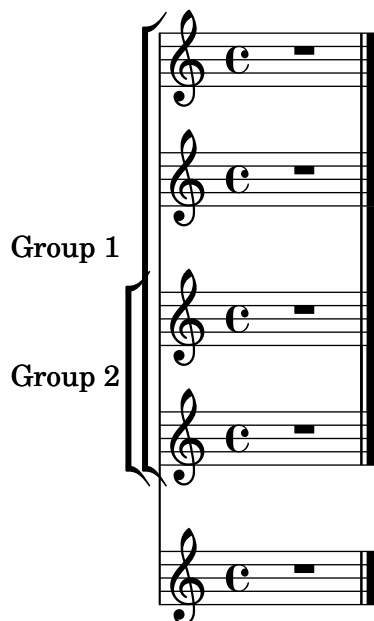
A musical staff with a treble clef and a common time signature 'C'. The staff contains nine measures of music, each with a single quarter note. The notes are: C4, D4, E4, F4, G4, A4, B4, C5, D5. The staff is labeled on the left with the text '6 St. Nm.' stacked vertically, with a line extending from the 'S' in 'St.' to the first measure of the staff.

A musical staff with a treble clef and a common time signature 'C'. The staff contains nine measures of music. The first eight measures each contain a single quarter note, and the ninth measure contains a whole rest. The notes are: C4, D4, E4, F4, G4, A4, B4, C5. The staff is labeled on the left with the text '15 St. Nm.' stacked vertically, with a line extending from the 'S' in 'St.' to the first measure of the staff.

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 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.

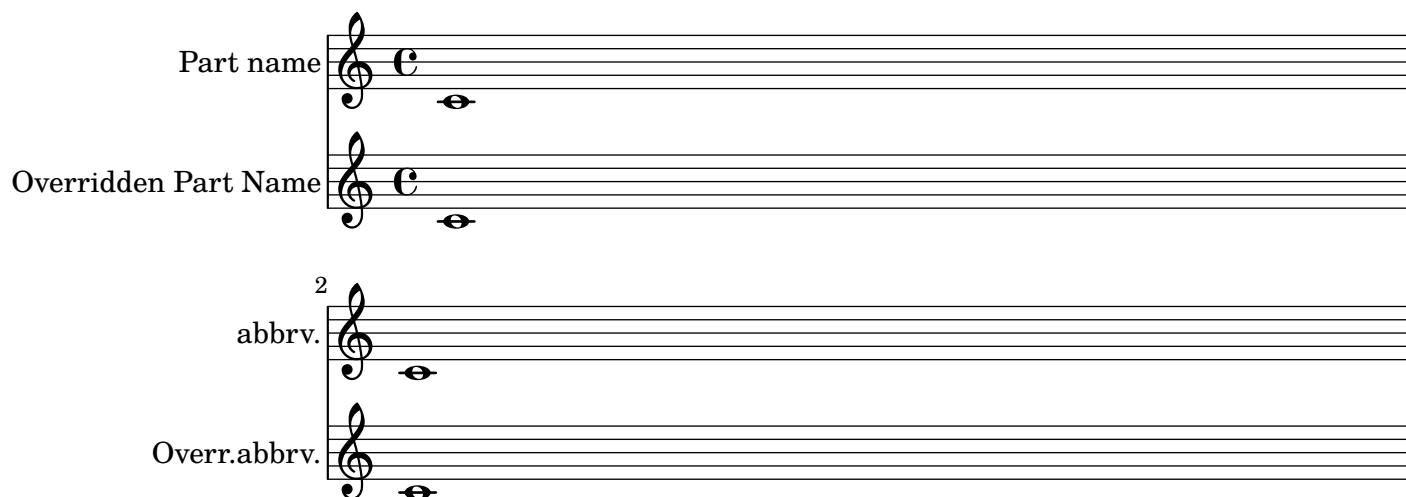
41h-TooManyParts.xml



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



## 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

Musical notation for a multi-voice part with a mid-measure clef change. The notation is in 6/8 time and consists of two staves. The first staff starts with a treble clef and changes to a bass clef in the middle of the first measure. The second staff starts with a bass clef and changes to a treble clef in the middle of the first measure. The notation includes a dynamic marking of *fp* and a fermata over the final note of the second staff.

## 43 ... One part on multiple staves

A simple piano staff

43a-PianoStaff.xml

Musical notation for a simple piano staff. The notation is in 4/4 time and consists of two staves. The first staff starts with a treble clef and the second staff starts with a bass clef. The notation includes a dynamic marking of *mf* and a fermata over the final note of the second staff.

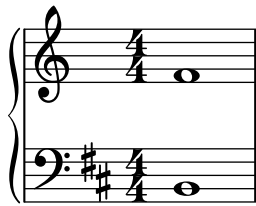
A piano staff with different keys and clefs for each of its staves. The keys and clefs for both staves are given at the very beginning of the measure.

43b-MultiStaff-DifferentKeys.xml

Musical notation for a piano staff with different keys and clefs. The notation is in 4/4 time and consists of two staves. The first staff starts with a treble clef and the second staff starts with a bass clef. The notation includes a dynamic marking of *mf* and a fermata over the final note of the second staff.

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.

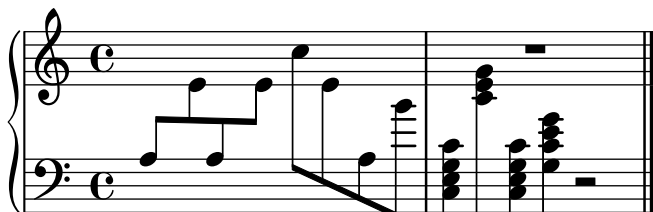
43c-MultiStaff-DifferentKeysAfterBackup.xml



A piano staff with two staves. The top staff is in treble clef with a 4/4 time signature and contains a whole note. The bottom staff is in bass clef with a key signature of two sharps (F# and C#) and a 4/4 time signature, also containing a whole note.

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.

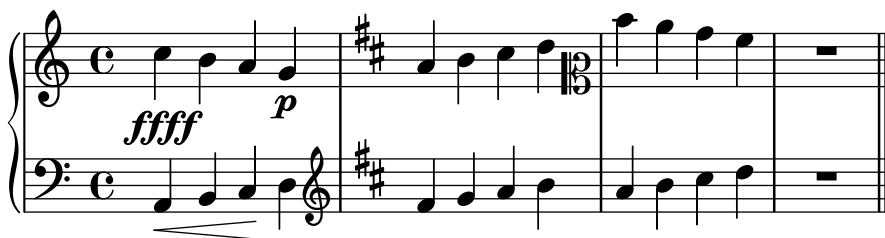
43d-MultiStaff-StaffChange.xml



A piano staff with two staves. The top staff is in treble clef with a common time signature (C) and contains a sequence of notes and chords. The bottom staff is in bass clef with a common time signature (C) and contains notes and chords. The notation shows a staff change where notes from the second staff appear on the first staff.

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

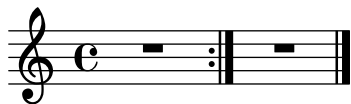


A piano staff with two staves. The top staff is in treble clef with a common time signature (C) and contains notes and chords. The bottom staff is in bass clef with a common time signature (C) and contains notes and chords. The notation includes dynamics like *ffff* and *p*, and clef changes.

## 45 ... Repeats

A simple, repeated measure (repeated 5 times)

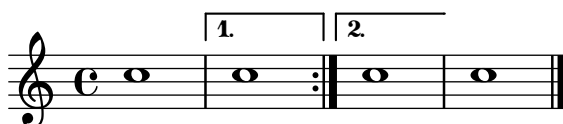
45a-SimpleRepeat.xml



A single staff in treble clef with a common time signature (C). It shows a single measure with a repeat sign (double bar line with two dots) and a final bar line.

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

45b-RepeatWithAlternatives.xml



A single staff in treble clef with a common time signature (C). It shows a repeat sign with two alternative endings labeled '1.' and '2.' above the staff.

Repeats can also be nested.

45c-RepeatMultipleTimes.xml



A single staff in treble clef with a common time signature (C). It shows a repeat sign with two alternative endings labeled '2' and '4' above the staff, indicating multiple repetitions.

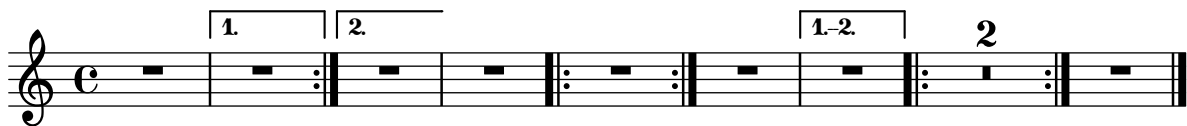
Nested repeats, each with alternative endings.

45d-Repeats-Nested-Alternatives.xml



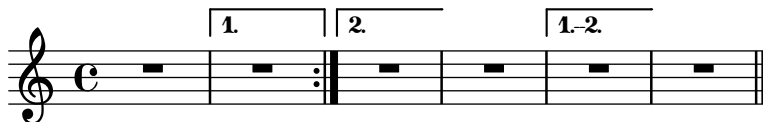
Some more nested repeats with alternatives. The barline between measure 7 and 8 will probably be messed up! (Should be a repeat on both sides!)

45e-Repeats-Nested-Alternatives.xml



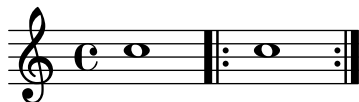
Some more nested repeats with alternatives, where the MusicXML file does not make sense in the first place. How well are applications able to cope with improper repeats and alternatives?

45f-Repeats-InvalidEndings.xml



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

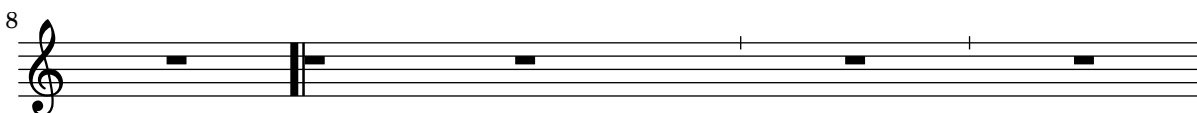
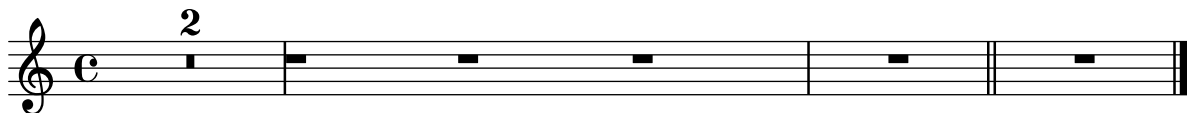
45g-Repeats-NotEnded.xml



## 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



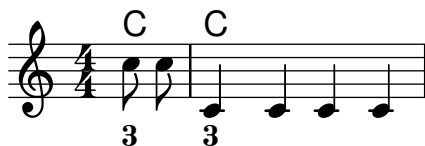
Measures can contain less notes than the time signature says. Here, the first and third measures contain only two quarters instead of four.

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.

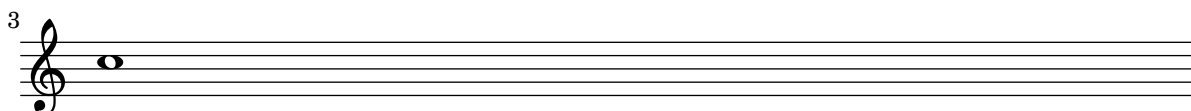
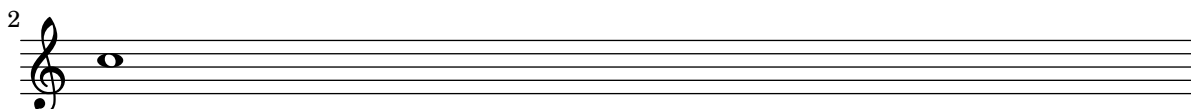
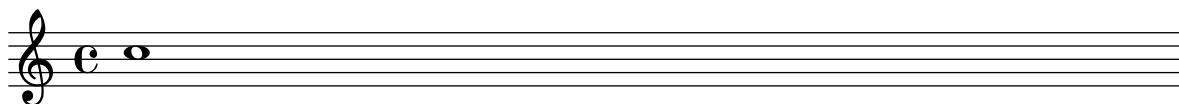
52a-PageLayout.xml

### 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

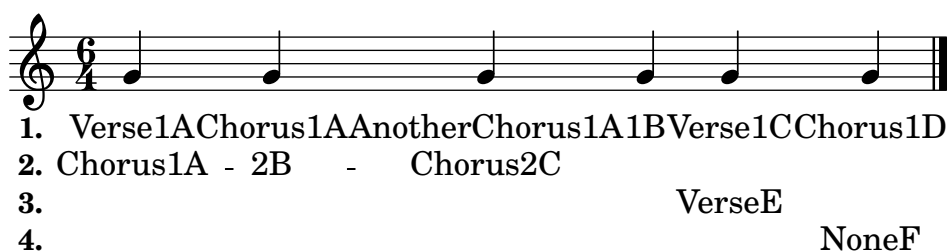


1. Ly - rics on notes \_

The image shows a musical staff in C major, 4/4 time. It contains four measures of music. The first measure has a quarter note G4 with a slur over it. The second measure has a quarter note A4 with a slur over it. The third measure has a quarter note B4 with a slur over it. The fourth measure has a quarter note C5 with a slur over it. The lyrics '1. Ly - rics on notes \_' are aligned below 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 G major, 6/4 time. It contains six measures of music, each with a single half note: G4, A4, B4, C5, B4, A4. The lyrics '1. Verse1AChorus1AAnotherChorus1A1BVerse1CChorus1D', '2. Chorus1A - 2B - Chorus2C', '3. VerseE', and '4. NoneF' are aligned below 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 C major, 4/4 time. It contains four measures of music. Each measure has a quarter note G4, a quarter note A4, and a quarter note B4, all beamed together. The lyrics '1. Me - lisma \_\_ Me - lisma \_\_ Me - lisma \_\_ Me - lisma \_\_' are aligned below 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 C major, 4/4 time. It contains one measure of music with a single half note G4. The lyrics '1. Lyrics 1', '2.', and '3.' are aligned below the note.

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 C major, 4/4 time. It contains eight measures of music, each with a single quarter note: C4, D4, E4, F4, G4, A4, B4, C5. The lyrics '1. a b c d e f g h' are aligned below 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 the first C, and E under e.

## 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<sup>lyd</sup>, B<sup>7</sup> #5 #9, E<sup>b</sup> <sup>sus2</sup>, G, D<sup>#</sup>, A<sup>o7</sup>, A<sup>#5</sup>.

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<sup>lyd</sup>, B<sup>7</sup> #5 #9, E<sup>b</sup> <sup>sus2</sup>, G, D<sup>#</sup>, A<sup>o7</sup>, C. Below the staff, fretboard diagrams are shown for each chord, with fingering numbers (i, ii, iii, xi) and string indicators (o, x).

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 with 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<sup>b</sup> m<sup>9</sup>, C, D<sup>7</sup>, C m<sup>7</sup> 11. Fretboard diagrams are shown above each staff, with fingering numbers (iv) and string indicators (o, x).



3  $C^{7\#5}$   $C^{7\flat5}$   $Cm^{\Delta}$   $C^6$   
 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  $F^{\flat\flat}/C$   $G^{\#}/D^{\#}$   $C$   $C-3+5b$

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, followed by two eighth notes, followed by two quarter notes, and ending with a double bar line. The notes are: C4 (quarter), D4 (eighth), E4 (eighth), F4 (quarter), G4 (quarter).

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

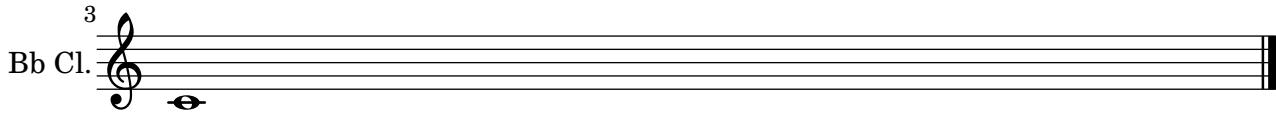
The image shows a musical score for ten different instruments, each on a separate staff. The instruments and their key signatures are: Clarinet in Eb (three sharps), Clarinet in Bb (two sharps), Clarinet in A (one flat), Horn in F (two sharps), Horn in Eb (three sharps), Piccolo Trumpet in A (one flat), Trumpet in Bb (two sharps), Trumpet in C (one sharp), Trumpet in D (one flat), and a staff labeled 'displayed c'=fis''' with a key signature of three sharps. Each staff contains a single note on a whole rest, indicating a sustained pitch.

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

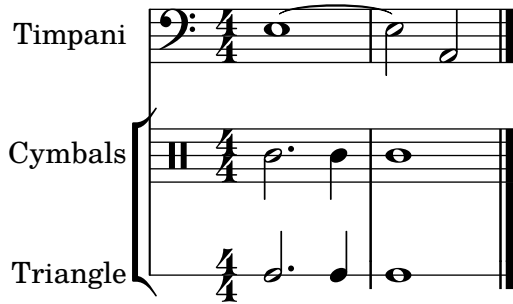
The image shows a musical score for a Clarinet in Eb. The staff starts with a key signature of one sharp (F#) and a common time signature (C). The first measure contains a whole note on the second line (F#). The second measure contains a whole note on the second line (F natural), indicating a key signature change to no accidentals. The staff is labeled 'Clarinet in Eb' on the left.



### 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!

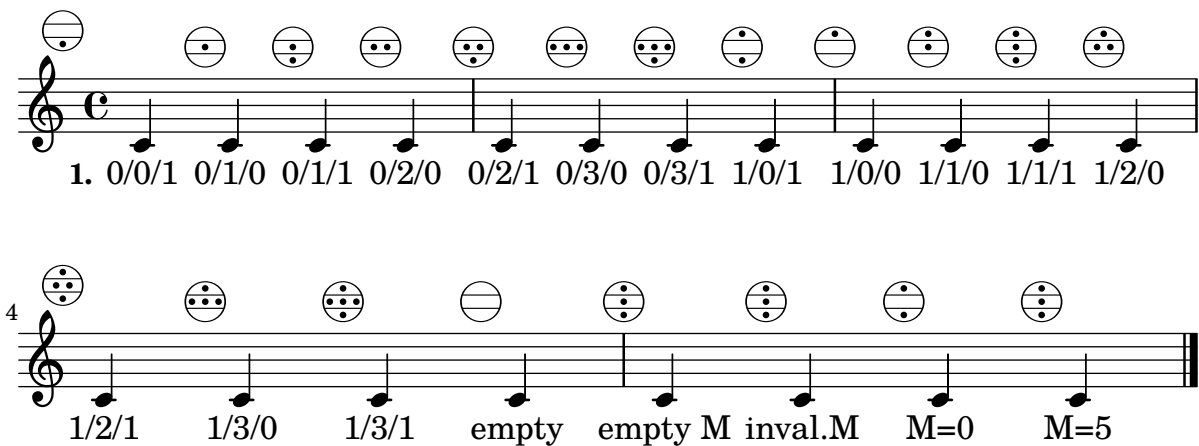
74a-FiguredBass.xml



### 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

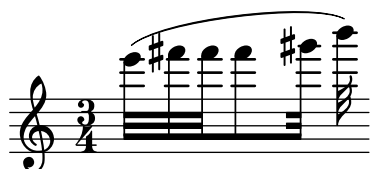
### Compressed MusicXML file



## 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 \_\_\_