

Music Xml to Braille Compiler

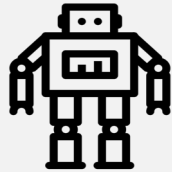
<Scanning & Parsing by JAVA CC>



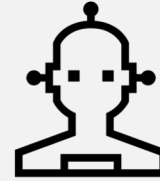
INDEX



Example XML



Tokenizing



Source Code



Parsing Idea



What is XML?

✓ Example of Music XML code

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE score-partwise SYSTEM "http://www.musicxml.org/dtds/partwise.dtd" PUBLIC "-//Recordare//DTD
MusicXML 3.0 Partwise/EN">
- <score-partwise>
-   <work>
      <work-number>L. 66</work-number>
      <work-title>Deux arabesques</work-title>
    </work>
-   <identification>
      <creator type="composer">Claude Debussy</creator>
      <rights>OpenScore (CC0)</rights>
    </identification>
-   <encoding>
      <software>MuseScore 2.1.0</software>
      <encoding-date>2017-12-08</encoding-date>
      <supports type="yes" element="accidental"/>
      <supports type="yes" element="beam"/>
      <supports type="yes" element="print" value="yes" attribute="new-page"/>
      <supports type="yes" element="print" value="yes" attribute="new-system"/>
      <supports type="yes" element="stem"/>
    </encoding>
      <source>http://musescore.com/openscore/scores/4788704</source>
    </identification>
+ <defaults>
      <credit page="1">
        <credit-words font-size="8" valign="bottom" justify="center" default-y="129.032"
          default-x="677.612">OpenScore (CC0)</credit-words>
      </credit>
- <part-list>
      <score-part id="P1">
        <part-name>Piano</part-name>
        <part-abbreviation>Pno.</part-abbreviation>
        <score-instrument id="P1-I1">
          <instrument-name>Piano</instrument-name>
        </score-instrument>
        <midi-device id="P1-I1" port="1"/>
        <midi-instrument id="P1-I1">
          <midi-channel>1</midi-channel>
          <midi-program>1</midi-program>
          <volume>78.7402</volume>
          <pan>0</pan>
        </midi-instrument>
      </score-part>
- </part-list>
      <part id="P1">
        <measure width="422.28" number="1">
          <print>
            <system-layout>
              <system-margins>
                <left-margin>71.00</left-margin>
```

Not HTML. Seems like similar but XML and HTML has different purpose.

HTML got some promised tag. But XML can define that tag format.

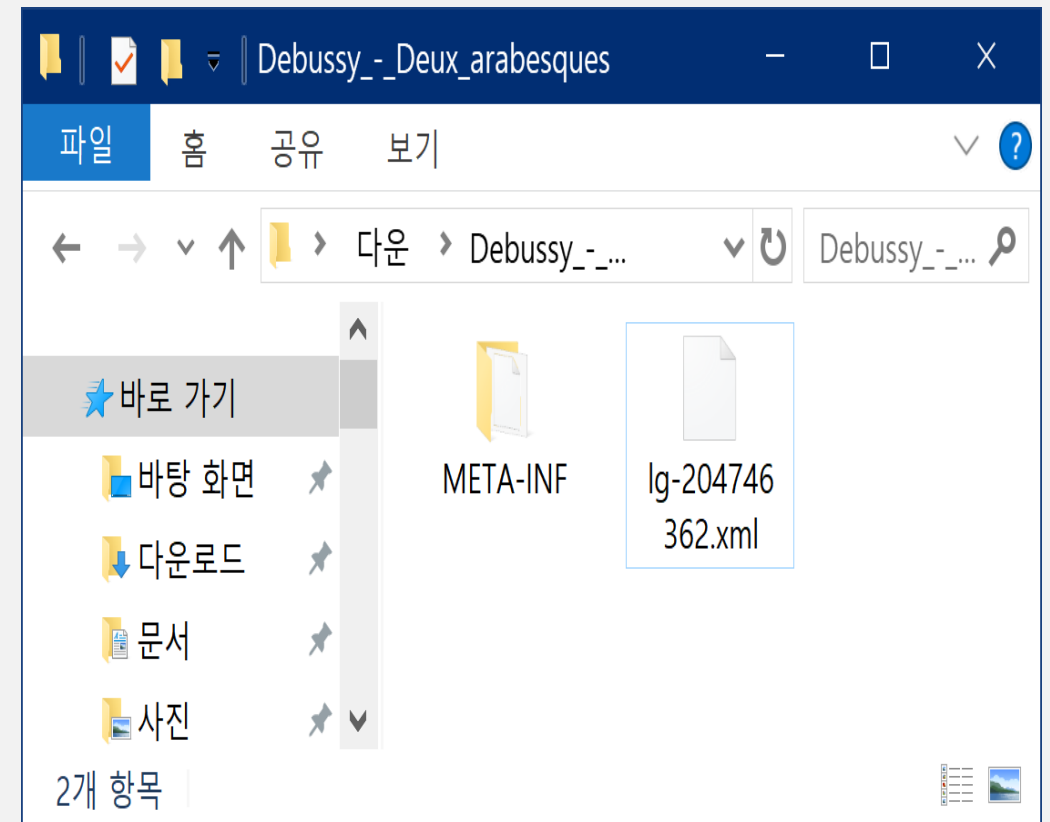
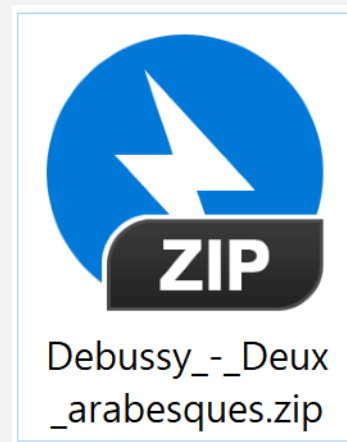
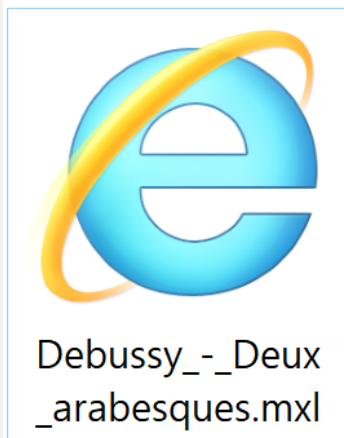
Purpose of HTML: Data Expression
Purpose of XML: Data Exchange

Part of Deux arabesques(Classic Music)



XML to Music XML

- ✓ Music XML is zip of XML code





Schema of Music XML

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE score-partwise SYSTEM "http://www.musicxml.org/dtds/partwise.dtd" PUBLIC "-//Recordare//DTD MusicXML 3.0
Partwise//EN">
- <score-partwise>
-   <work>
      <work-number>L. 66</work-number>
      <work-title>Deux arabesques</work-title>
    </work>
-   <identification>
      <creator type="composer">Claude Debussy</creator>
      <rights>OpenScore (CC0)</rights>
-     <encoding>
        <software>MuseScore 2.1.0</software>
        <encoding-date>2017-12-08</encoding-date>
        <supports type="yes" element="accidental"/>
        <supports type="yes" element="beam"/>
        <supports type="yes" element="print" value="yes" attribute="new-page"/>
        <supports type="yes" element="print" value="yes" attribute="new-system"/>
        <supports type="yes" element="stem"/>
      </encoding>
      <source>http://musescore.com/openscore/scores/4788704</source>
    </identification>
-   <defaults>
-     <scaling>
        <millimeters>6.2</millimeters>
        <tenths>40</tenths>
      </scaling>
-     <page-layout>
        <page-height>1915.67</page-height>
        <page-width>1355.22</page-width>
-        <page-margins type="even">
          <left-margin>64.5161</left-margin>
          <right-margin>64.5161</right-margin>
          <top-margin>64.5161</top-margin>
          <bottom-margin>129.032</bottom-margin>
        </page-margins>
-        <page-margins type="odd">
          <left-margin>64.5161</left-margin>
          <right-margin>64.5161</right-margin>
          <top-margin>64.5161</top-margin>
          <bottom-margin>129.032</bottom-margin>
        </page-margins>
      </page-layout>
      <word-font font-size="10" font-family="FreeSerif"/>
      <lyric-font font-size="11" font-family="FreeSerif"/>
    </defaults>

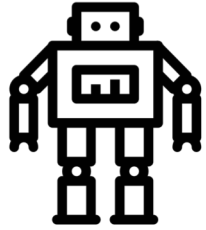
```



Schema of Music XML

```
- <part-list>
  - <score-part id="P1">
    <part-name>Piano</part-name>
    <part-abbreviation>Pno.</part-abbreviation>
    - <score-instrument id="P1-I1">
      <instrument-name>Piano</instrument-name>
    </score-instrument>
    <midi-device id="P1-I1" port="1"/>
    - <midi-instrument id="P1-I1">
      <midi-channel>1</midi-channel>
      <midi-program>1</midi-program>
      <volume>78.7402</volume>
      <pan>0</pan>
    </midi-instrument>
  </score-part>
</part-list>
```

```
- <part id="P1">
  - <measure width="422.28" number="1">
    - <print>
      - <system-layout>
        - <system-margins>
          <left-margin>71.00</left-margin>
          <right-margin>0.00</right-margin>
        </system-margins>
        <top-system-distance>245.00</top-system-distance>
      </system-layout>
      - <staff-layout number="2">
        <staff-distance>90.00</staff-distance>
      </staff-layout>
    </print>
    - <attributes>
      <divisions>6</divisions>
      - <key>
        <fifths>4</fifths>
      </key>
      - <time symbol="common">
        <beats>4</beats>
        <beat-type>4</beat-type>
      </time>
      <staves>2</staves>
      - <clef number="1">
        <sign>G</sign>
        <line>2</line>
      </clef>
      - <clef number="2">
        <sign>G</sign>
        <line>2</line>
      </clef>
    </attributes>
```



Idea about Tokenizing

✓ Part – Part list

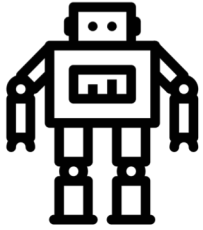
```

<part-list>
  <score-part id="P1">
    <part-name>
      Piano
    <part-abbreviation>
      Pno.
    <score-instrument id="P1-I1">
      <instrument-name>
        Piano
      <midi-device id="P1-I1" port="1" />
    <midi-instrument id="P1-I1">
      <midi-channel>
        1
      <midi-program>
        1
      <volume>
        78.7402
      <pan>
        0
  
```

✓ Work, Identification, Default ...

```

<note default-x="119.00" default-y="-180.00">
  <pitch>
    <step>
      C
    <alter>
      1
    <octave>
      4
  <duration>
    2
  <voice>
    1
  <type>
    eighth
  <time-modification>
    <actual-notes>
      3
    <normal-notes>
      2
  <stem>
    up
  <staff>
    2
  <beam number="1">
    begin
  
```



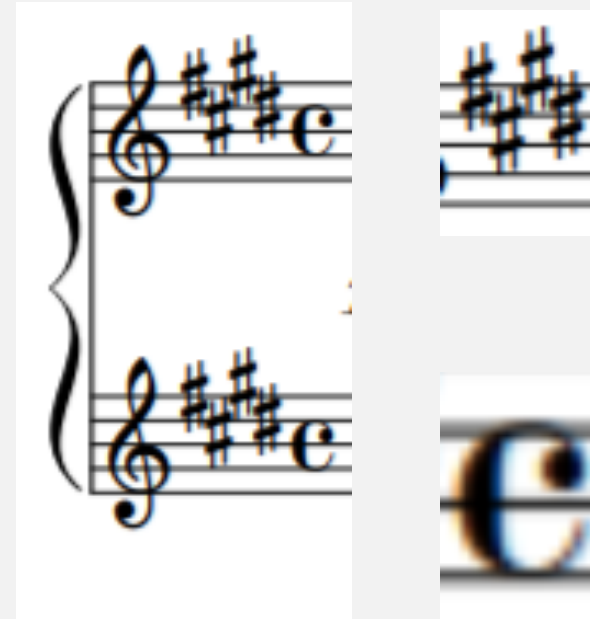
Idea about Tokenizing

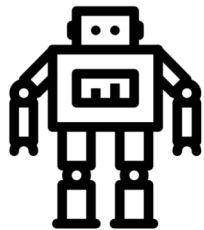
✓ Below Note – triplet, slur

```
<notations>  
  <triplet type="start" bracket="no" show-number="none" />  
  <slur type="start" number="1" />
```



✓ Attributes and Fifths, Clef





Idea about Tokenizing

✓ To jump for exact measure

Première arabesque Claude Debussy

Andantino con moto

p

4

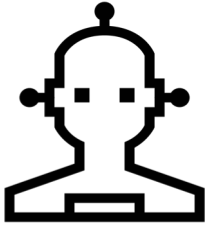
rit.

a tempo

pp

✓ Only use Print new system

```
<print new-system="yes">
  <system-layout>
    <system-margins>
      <left-margin>
        21.00
      <right-margin>
        0.00
    <system-distance>
      200.00
  <staff-layout number="2">
    <staff-distance>
      90.00
```



Tokenizing Code In JAVACC

✓ Source Code of Token

```
TOKEN :
{
    < PART : "part" >
    < MEASURE : "measure" >
    < NOTE : "note" >
    < ATTRIBUTE : "attribute" >
    < DIVISIONS : "divisions" >
    < KEY : "key" >
    < FIFTHS : "fifths" >
    < TIME : "time" >
    < BEATS : "beats" >
    < BEATTYPE : "beat-type" >
    < STAVES : "staves" >
    < CLEF : "clef" >
    < SIGN : "sign" >
    < LINE : "line" >
    < PRINT : "print" >
}

TOKEN :
{
    < NUMBER : "number=\"[1-3]\"" >
    < NEWLINE : "new-system=\"yes\"" >
}
```

```
TOKEN :
{
    < _MEASURE : < PRINT >< ATTRIBUTES >< NOTE > >
    < _ATTRIBUTES : < DIVISIONS >< KEY >< TIME >< STAVES >< CLEF > >
    < _TIME : < BEATS >< BEATTYPE > >
    < _CLEF : < SIGN >< LINE > >
}

TOKEN :
{
    < PART : "part" >
    < MEASURE : "measure" >
    < PRINT : "print" >
    < ATTRIBUTES : "attributes" >
    < DIVISIONS : "divisions" >
    < KEY : "key" >
    < FIFTHS : "fifths" >
    < TIME : "time" >
    < BEATS : "beats" >
    < BEATTYPE : "beat-type" >
    < STAVES : "staves" >
    < CLEF : "clef" >
    < SIGN : "sign" >
    < LINE : "line" >
    < NOTE : "note" >
    < PITCH : "pitch" >
    < STEP : "step" >
    < OCTAVE : "octave" >
    < DURATION : "duration" >
    < TYPE : "type" >
}

TOKEN :
{
    < NUMBER : "number=\"[1-3]\"" >
    < NEWLINE : "new-system=\"yes\"" >
}
```



Parsing = Have to be simple

✓ XML Parser in Bitbucket

An easy way to parse musicXML files in java

Posted by dorien on Thursday, 5 February 2015

For a recent project, I wrote a musicXML parser in java. The code is available on Bitbucket.

musicXML.

MusicXMLparserDH is a java musicXML parser that parses a musicXML file in Note objects with have properties such as pitch, accidental, duration, start time etc. It outputs an ArrayList that contains all of the Notes in sequence. A list of notes per time slice is also provided. The main time saver in using this library is that the note onsets are already calculated.

The motivation for this library was my need for an easy way to read in a large corpus of music and use it in a format easily usable for algorithmic optimization/analysis.

In the future, the Note structure will be expanded to include more characteristics. (One could fairly easily do that).
An export function will also be added that allows a user to manipulate notes and change them in the original file.

Do you want to contribute something to the code? Contact me.

Not using JAVACC. But useful for study

✓ Study about Braille Music

Allegretto

p cresc.

mf

The image displays two staves of musical notation. The top staff is labeled 'Allegretto' and features a treble clef, a key signature of one sharp (F#), and a 2/4 time signature. It contains a melody starting with a half note G4, followed by quarter notes A4, B4, and C5, and ending with a half note B4. The bottom staff is a bass line starting with a half note G2, followed by quarter notes F2, E2, and D2, and ending with a half note C2. Below the musical notation is a corresponding Braille representation of the same music, showing the complexity of transcribing musical notation into Braille.

Not easy for find data. Only access for the disalbed

Thank you