MusicQuery

A graphical music query language

Matan Gover

SIMSSA Workshop XVII

Motivation

Bach never used parallel fifths!

Beethoven's 5th contains 243 occurrences of the main motive

I wish I could verify these claims...

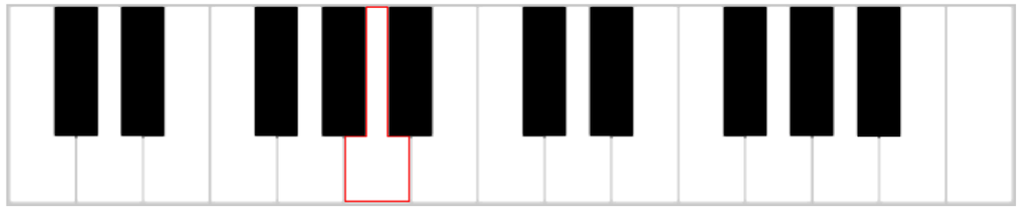
Goal

A search engine for symbolic music

Existing Solutions

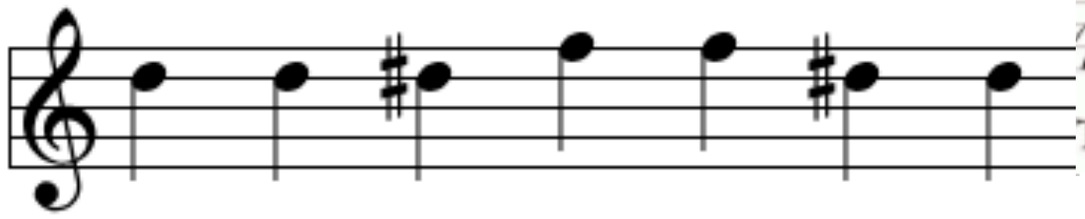
Music Ngram Viewer

Please enter a melody or a sequence of chords (advanced use)



62 0 1 2 0 -2 -1 -2 -2 | melody | Search

Petrucci Music Library | Smoothing: 0 | Normalized



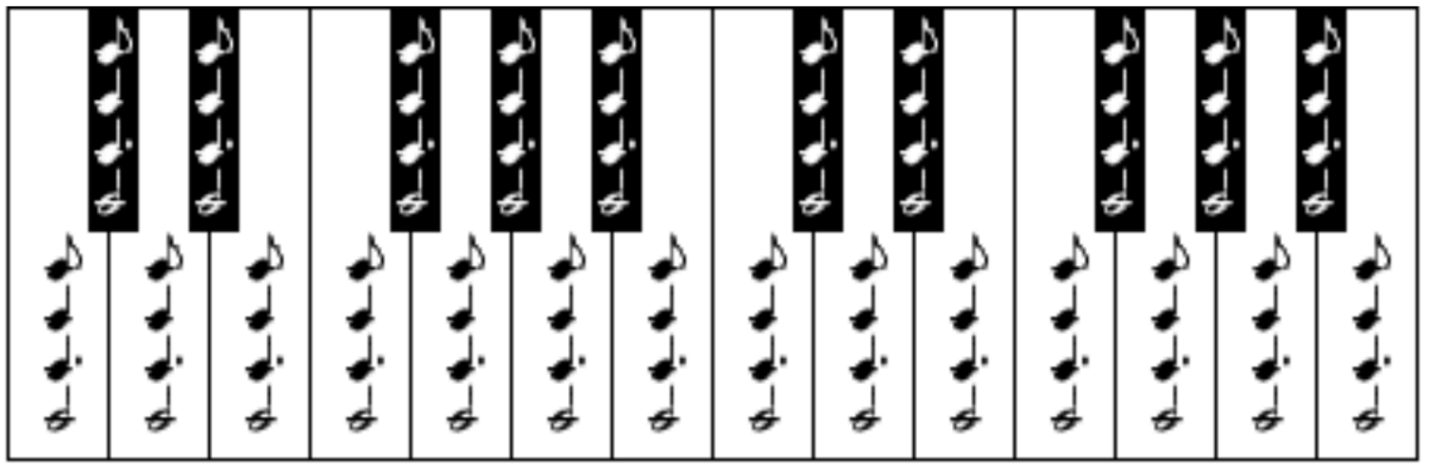
http://www.peachnote.com

http://www.musipedia.org

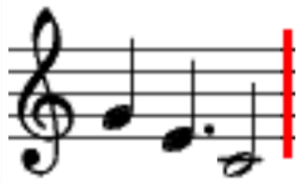
musipedia
The Open Music Encyclopedia

KEYBOARD SEARCH

CONTOUR SEARCH



Your melody:



Easy to use

Too simplistic

VoiceLeadingQuartet.**parallelFifth**()

Returns true if the motion is a parallel or antiparallel Perfect Fifth, allowing displacement by an octave (e.g., 5th to a 12th).

We will make the examples shorter with this abbreviation: >>> N = note.Note

parallel fifths

```
>>> vlq = voiceLeading.VoiceLeadingQuartet(N("G4"), N("A4"),  >>>
N("C4"), N("D4"))
>>> vlq.parallelFifth()
True
```

music21.search.base.**approximateNoteSearch**(*thisStream*, *otherStreams*)

searches the list of otherStreams and returns an ordered list of matches (each stream will have a new property of matchProbability to show how well it matches)

```
>>> s = converter.parse("tinynotation: 4/4 c4 d8 e16 FF a'4 b-")  >>>
>>> o1 = converter.parse("tinynotation: 4/4 c4 d8 e GG a' b-4")
>>> l = search.approximateNoteSearch(s, [o1, o2, o3])
>>> for i in l:
...     print("%s %r" % (i.id, i.matchProbability))
o1 0.666666...
```

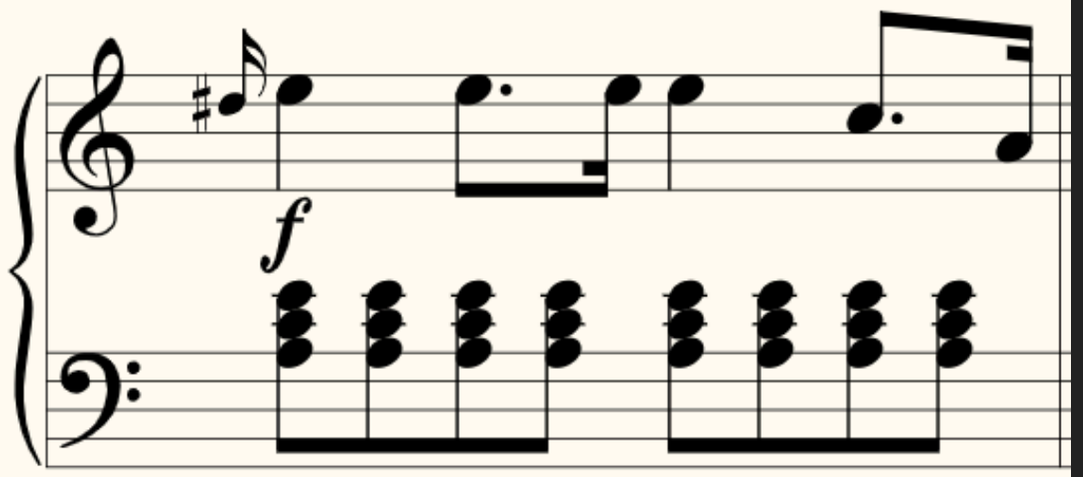
Extremely powerful*

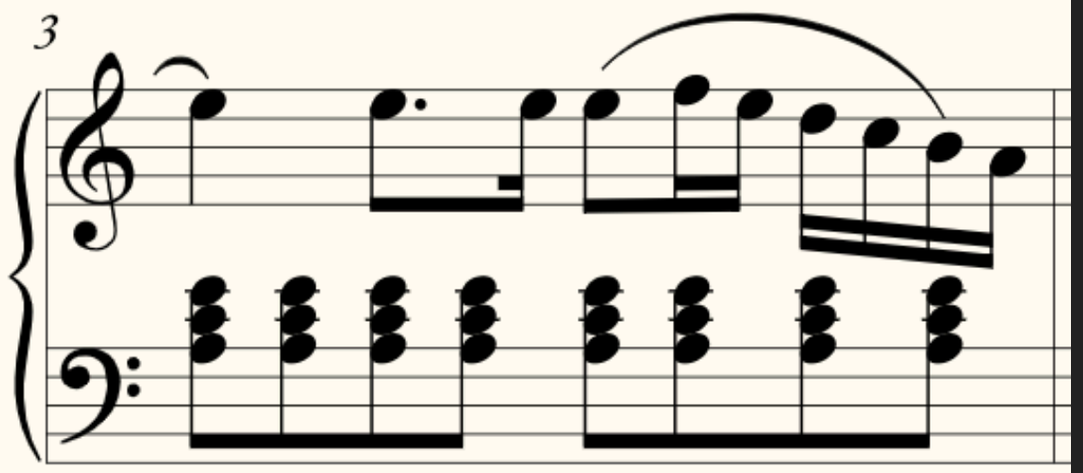
*Only if you can code

VerovioHumdrumViewer

Mozart, Piano Sonata No. 8 in A minor, K

```
!!!COM: Mozart, Wolfgang Amadeus
!!!OTL: Piano Sonata No. 8 in A minor
**kern      **kern      **dynam
*staff2     *staff1     *staff1/2
*clefF4     *clefG2     *clefG2
=1-         =1-         =1-
.           16dd#qq     .
8A 8c 8eL   4ee         f
8A 8c 8e    .           .
8A 8c 8e    8.eeL       .
8A 8c 8eJ   .           .
.           16eeJk      .
8A 8c 8eL   4ee         .
8A 8c 8e    .           .
8A 8c 8e    8.ccL>      .
8A 8c 8eJ   .           .
.           16aJk       .
=2          =2          =2
.           16aqq       .
8A 8B 8d 8eL            4g#         .
8A 8B 8d 8e .           .
8A 8B 8d 8e 2g#         .
```





5

http://verovio.humdrum.org/ by Craig Sapp

Picardy third	3[+] ==
Landini cadence	[Mm]6 P5.*v6 P8
The pitch G followed optionally by a single G# followed by one or more records containing one or more pitches from an A major triad, the last of which must end a phrase	[Gg]+[^#-] + [Gg]+#[^#] ? ([Aa]+|([Cc]+#)|[Ee]+)[^#-]* (}.*([Aa]+|([Cc]+#)|[Ee]+) [^#-]))|(([Aa]+|([Cc]+#)|[Ee]+) [^#-].*})

Very powerful

Steep learning curve
Text manipulation

Revelation

When I search for music
I want my query to look like music

Query language

Expressive
Moderate learning curve
Looks like music

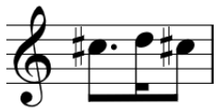
Proof of concept

https://www.matangover.com/musicquery

MusicQuery About Code by Matan Gover

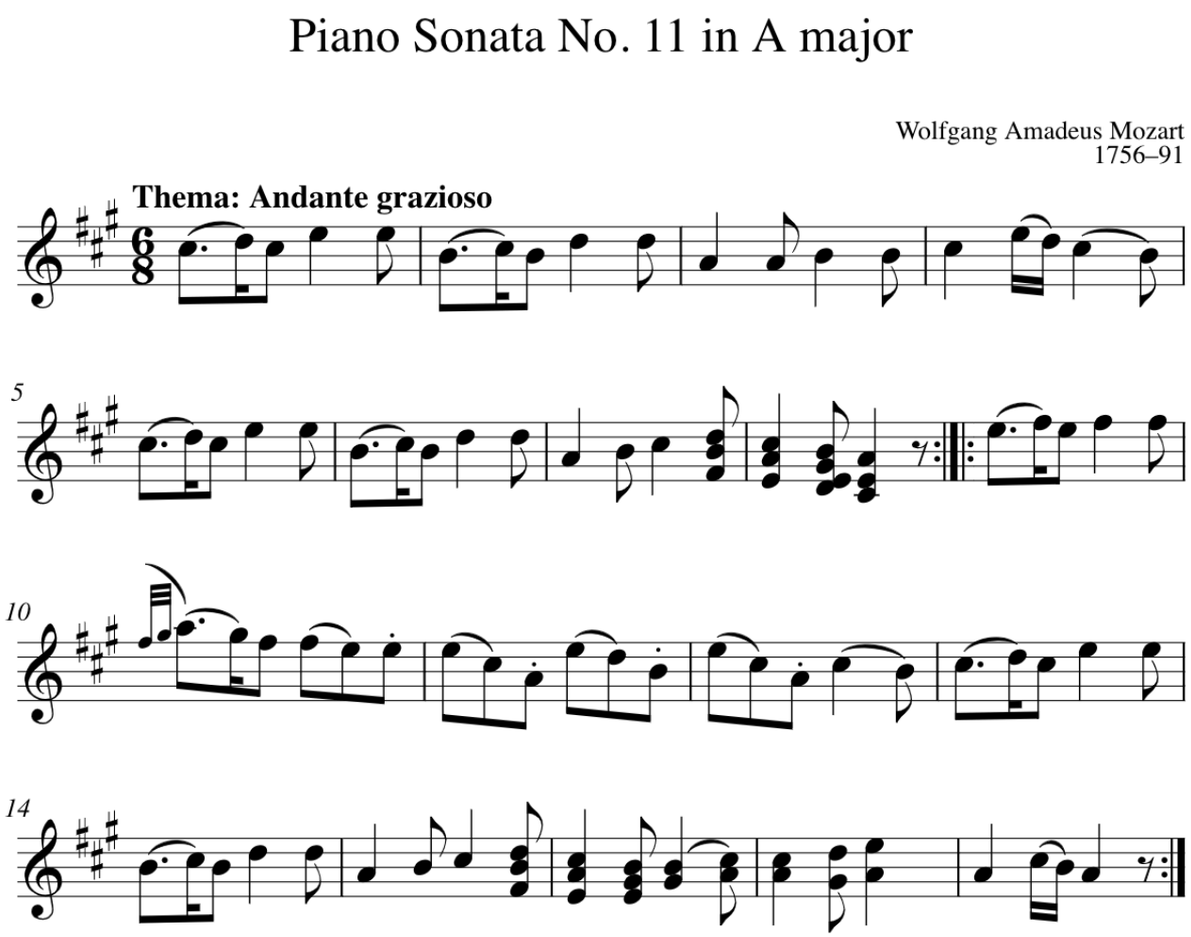
Search Clear Examples

```
<beam>
    <note pname="c" oct="5" dur="8" dots="1" accid="s"/>
    <note pname="d" oct="5" dur="16"/>
    <note pname="c" oct="5" dur="8" accid="s"/>
</beam>
```



MEI engraved with Verovio

Music Text Score



Search Clear Examples

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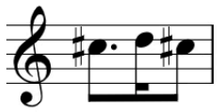
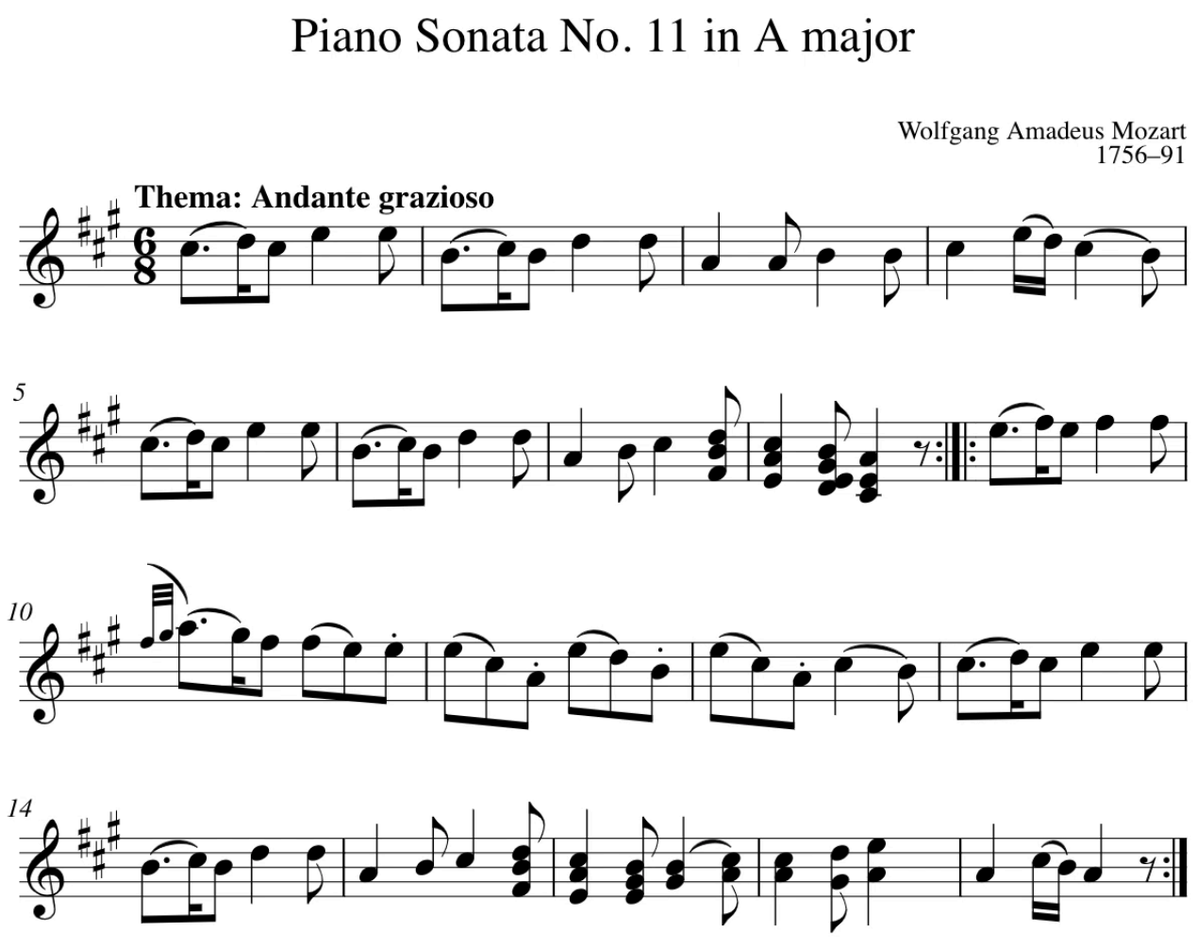
<beam>
    <note pname="c" oct="5" dur="8" dots="1" accid="s"/>
    <note pname="d" oct="5" dur="16"/>
    <note pname="c" oct="5" dur="8" accid="s"/>
</beam>
```



Music Text Score



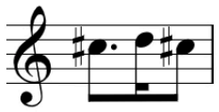
MEI engraved with Verovio

https://www.matangover.com/musicquery/#score-music

MusicQuery About Code by Matan Gover

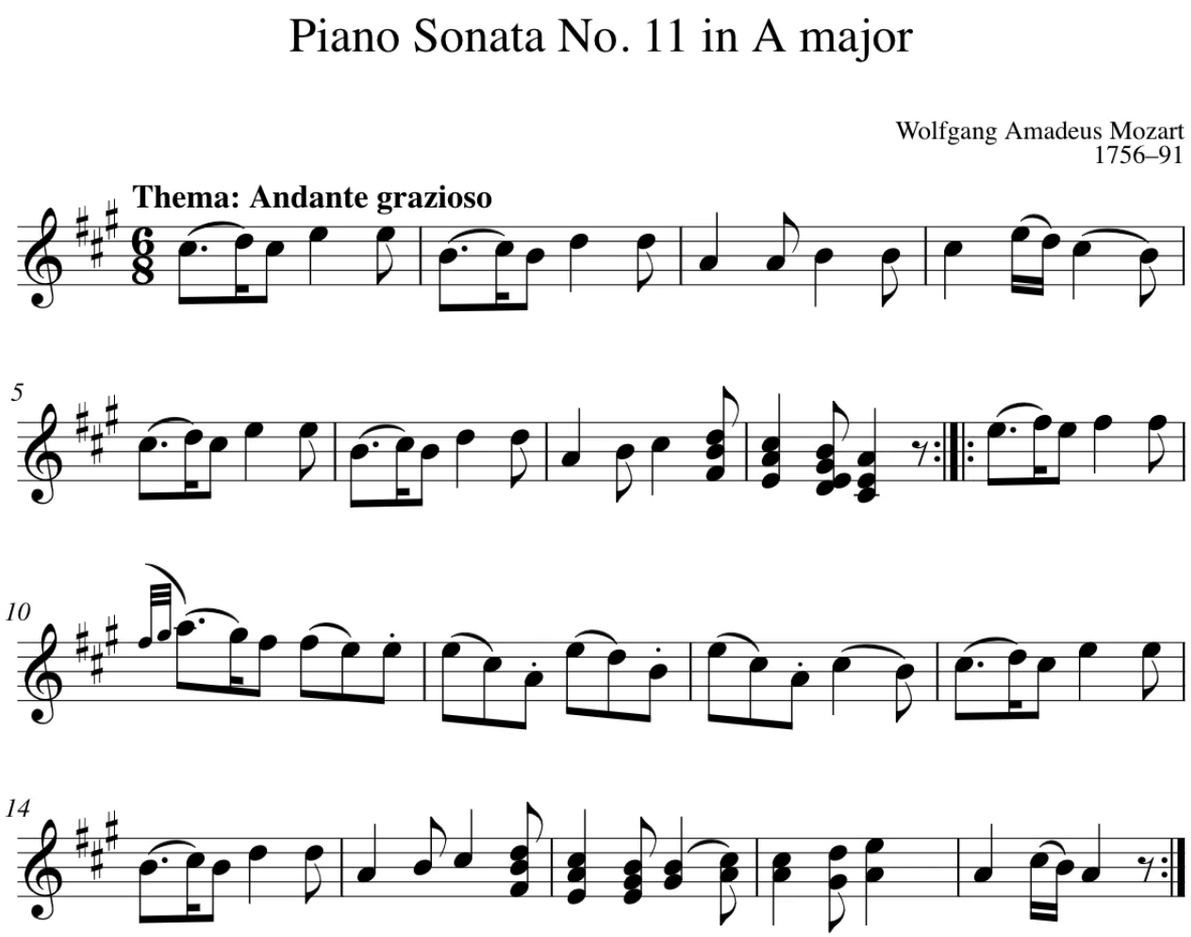
Search Clear Examples

```
<beam>
    <note pname="c" oct="5" dur="8" dots="1" accid="s"/>
    <note pname="d" oct="5" dur="16"/>
    <note pname="c" oct="5" dur="8" accid="s"/>
</beam>
```



MEI engraved with Verovio

Music Text Score

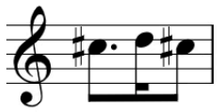


Run query

MusicQuery About Code by Matan Gover

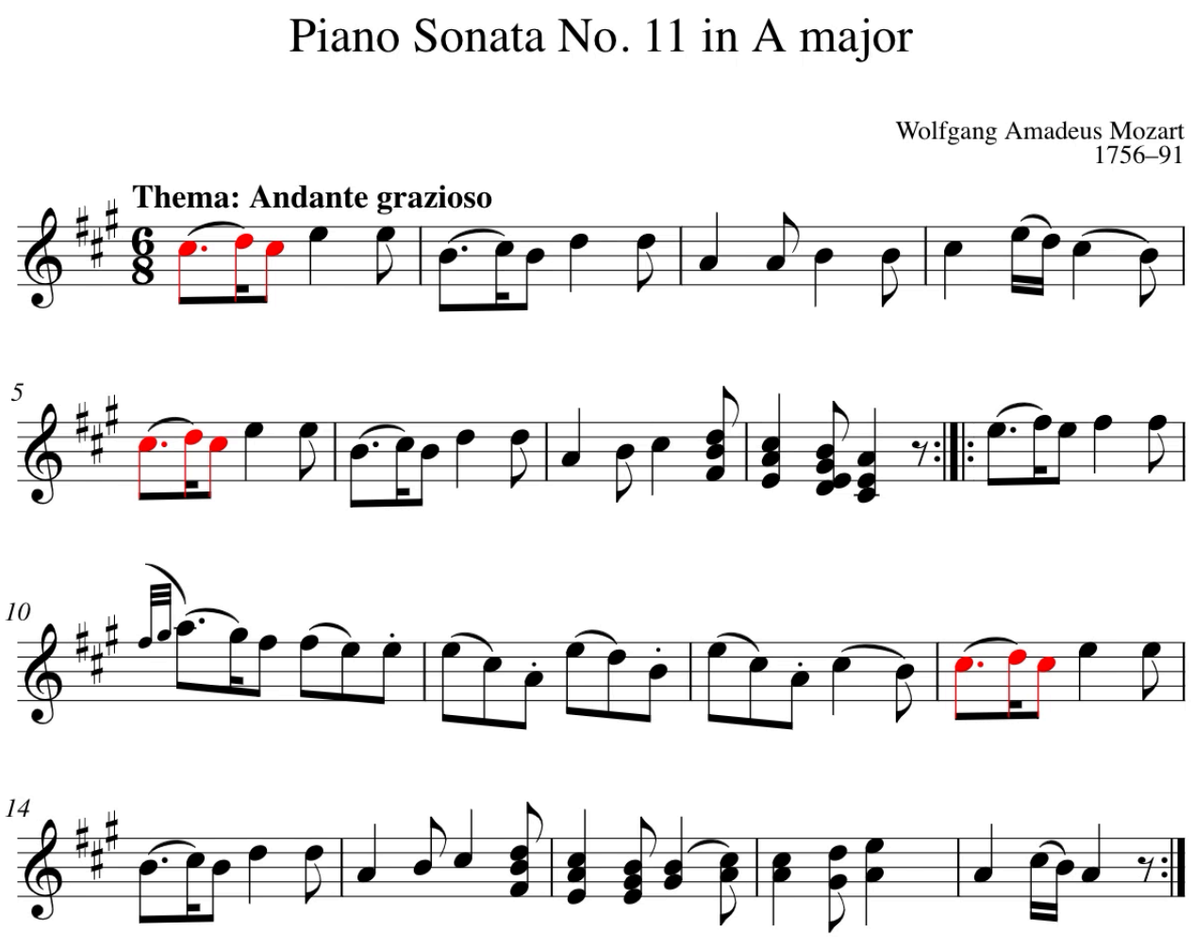
Search Clear Examples

```
<beam>
    <note pname="c" oct="5" dur="8" dots="1" accid="s"/>
    <note pname="d" oct="5" dur="16"/>
    <note pname="c" oct="5" dur="8" accid="s"/>
</beam>
```



MEI engraved with Verovio

Music Text Score

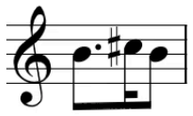


Modify query

MusicQuery About Code by Matan Gover

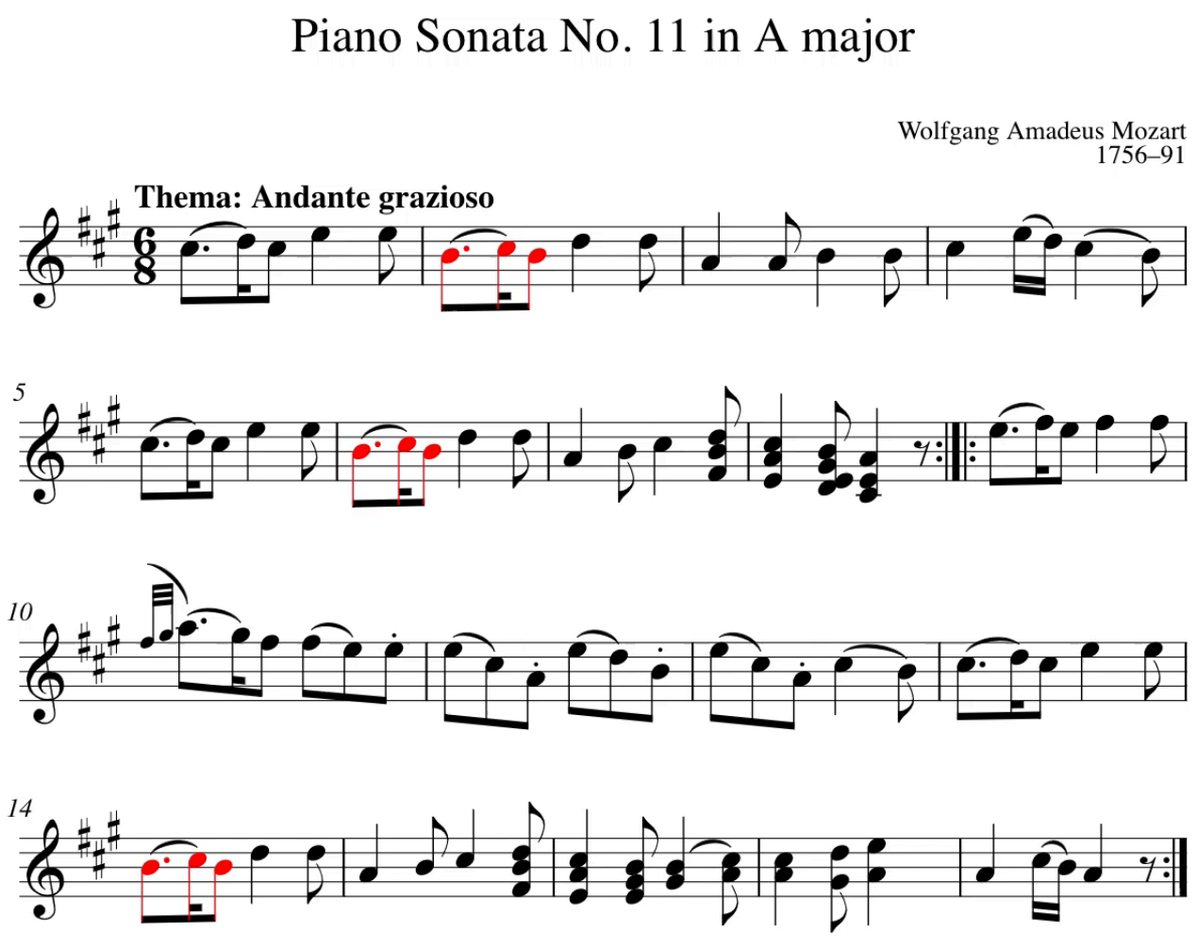
Search Clear Examples

```
<beam>
    <note pname="b" oct="4" dur="8" dots="1"/>
    <note pname="c" oct="5" dur="16" accid="s"/>
    <note pname="b" oct="4" dur="8"/>
</beam>
```



MEI engraved with Verovio

Music Text Score

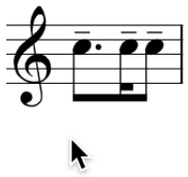


Rhythm-only

MusicQuery About Code by Matan Gover

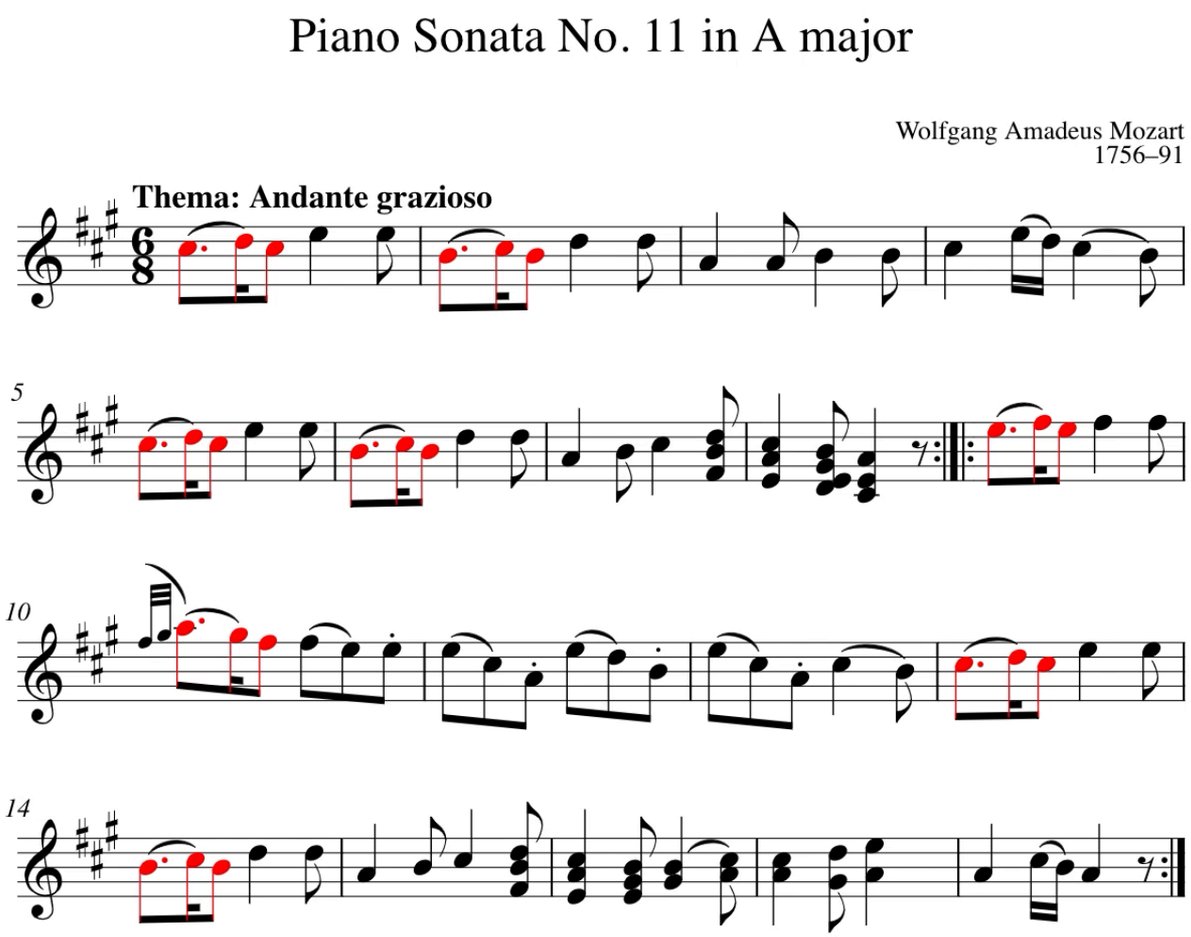
Search Clear Examples

```
<beam>
    <note pname="c" oct="5" dur="8" dots="1" artic="ten"/>
    <note pname="c" oct="5" dur="16" artic="ten"/>
    <note pname="c" oct="5" dur="8" artic="ten"/>
</beam>
```



MEI engraved with Verovio

Music Text Score



Pitch-only

MusicQuery About Code by Matan Gover

Search Clear Examples

```
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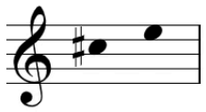
<note pname="e" oct="5" dur="4" stem.visible="false"/>
```



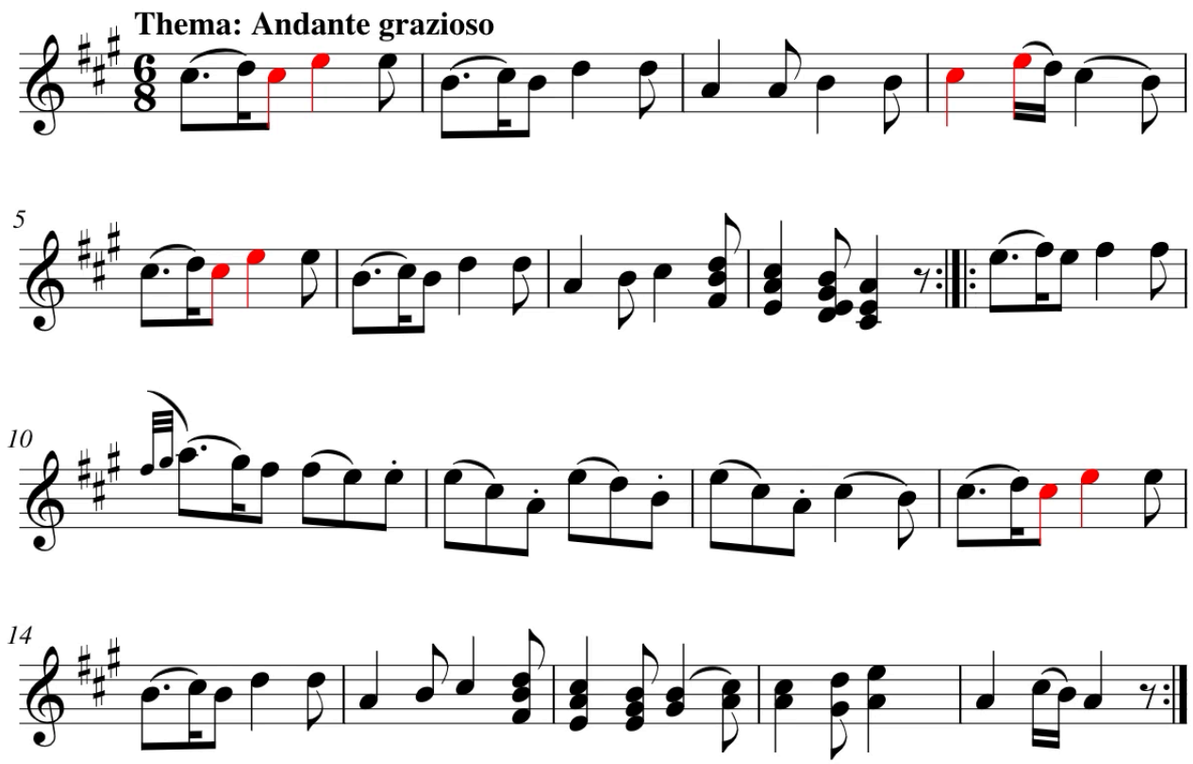
MEI engraved with Verovio

Music Text Score

Piano Sonata No. 11 in A major

Wolfgang Amadeus Mozart
1756–91

Thema: Andante grazioso

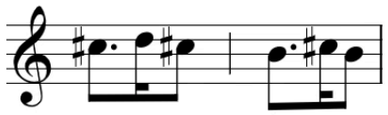


Or operator

MusicQuery About Code by Matan Gover

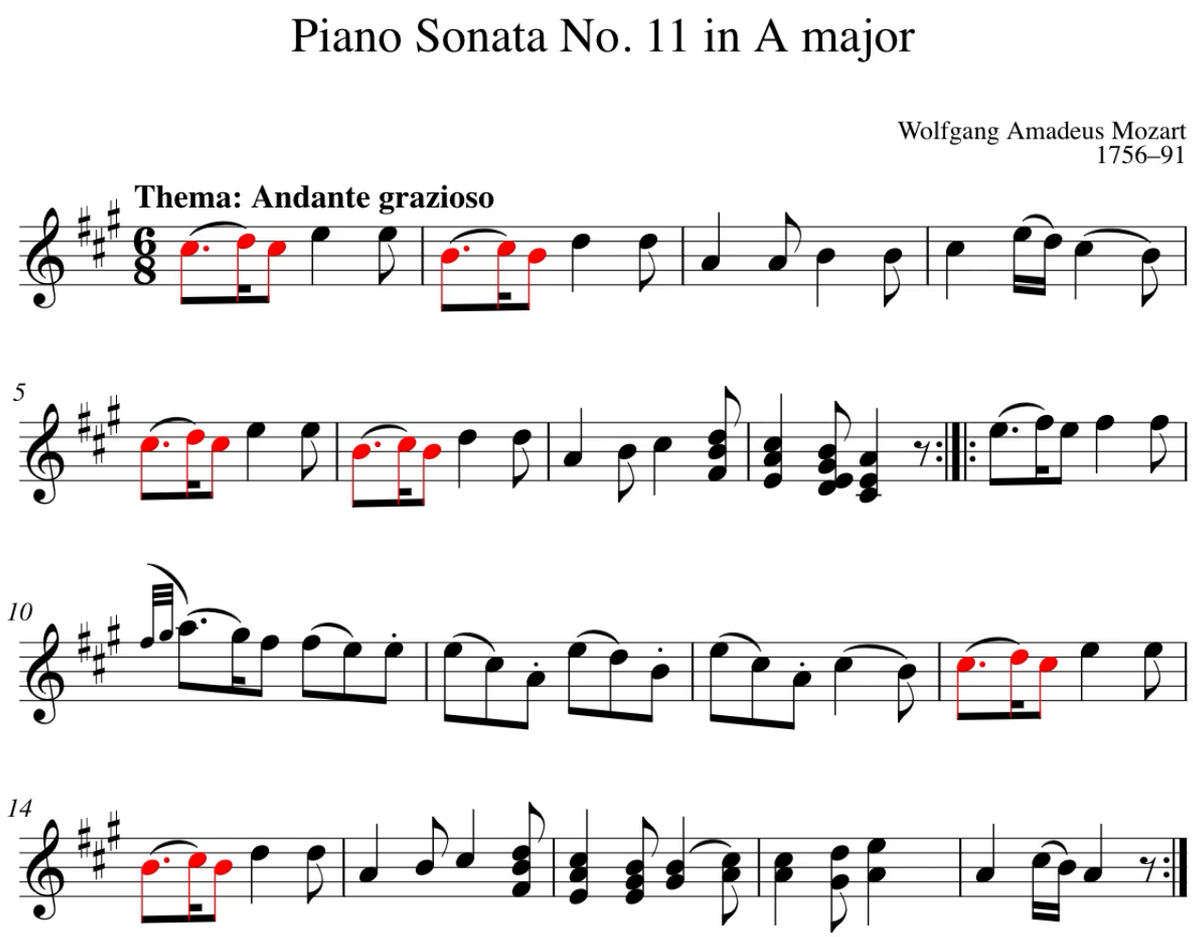
Search Clear Examples

```
<beam>
    <note pname="c" oct="5" dur="8" dots="1" accid="s"/>
    <note pname="d" oct="5" dur="16"/>
    <note pname="c" oct="5" dur="8" accid="s"/>
</beam>
<note type="or" pname="f" dur="4" oct="4" stem.len="6"/>
<beam>
    <note pname="b" oct="4" dur="8" dots="1"/>
    <note pname="c" oct="5" dur="16" accid="s"/>
    <note pname="b" oct="4" dur="8"/>
</beam>
```



MEI engraved with Verovio

Music Text Score

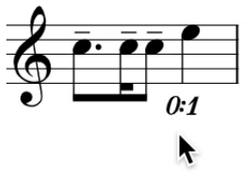


Quantifier – optional

MusicQuery About Code by Matan Gover

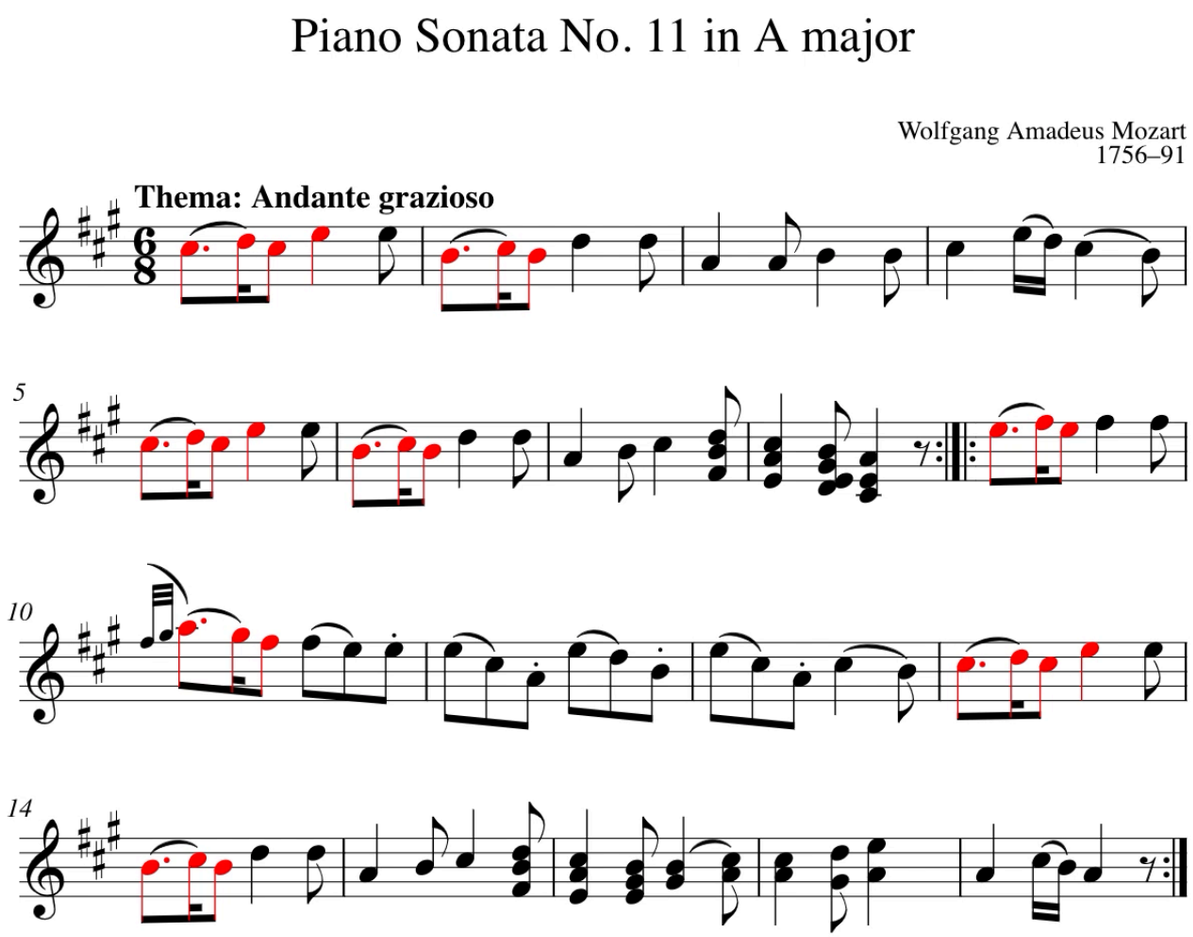
Search Clear Examples

```
<beam>
    <note pname="c" oct="5" dur="8" dots="1" artic="ten"/>
    <note pname="c" oct="5" dur="16" artic="ten"/>
    <note pname="c" oct="5" dur="8" artic="ten"/>
  </beam>
  <tuplet xml:id="group0" quantifier="?" num="1" numbase="1" type="quanti
    <note pname="e" oct="5" dur="4"/>
  </tuplet>
```



MEI engraved with Verovio

Music Text Score



Quantifier – one or more

MusicQuery About Code by Matan Gover

Search Clear Examples

```
<note pname="a" oct="4" dur="4" stem.visible="false"/>
<tuplet xml:id="group0" quantifier="+" num="1" numbase="1" type="quantifie
  <note pname="b" oct="4" dur="8" stem.visible="false"/>
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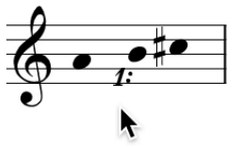
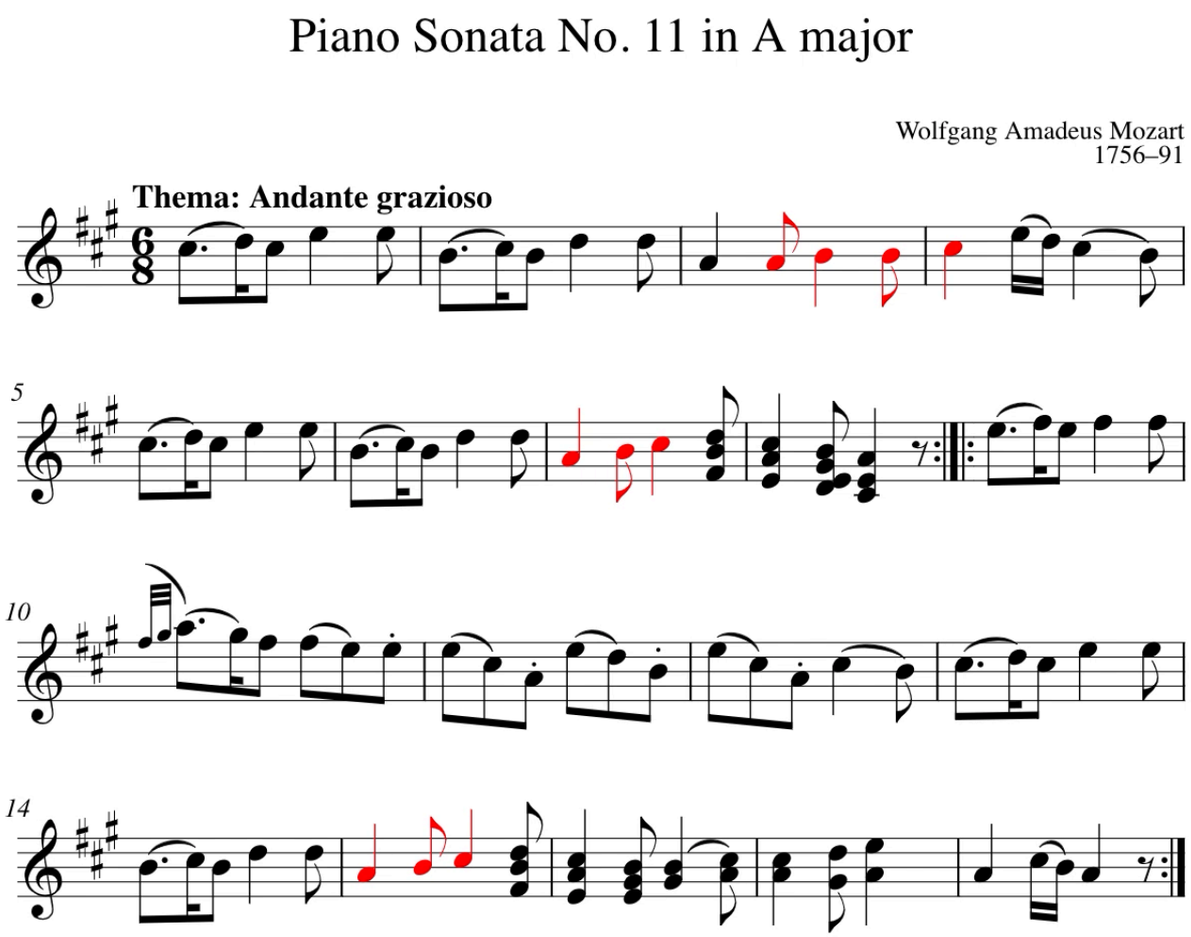
```



MEI engraved with Verovio

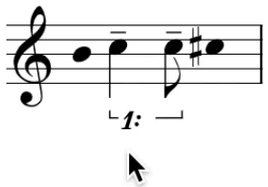
Music Text Score



MusicQuery About Code by Matan Gover

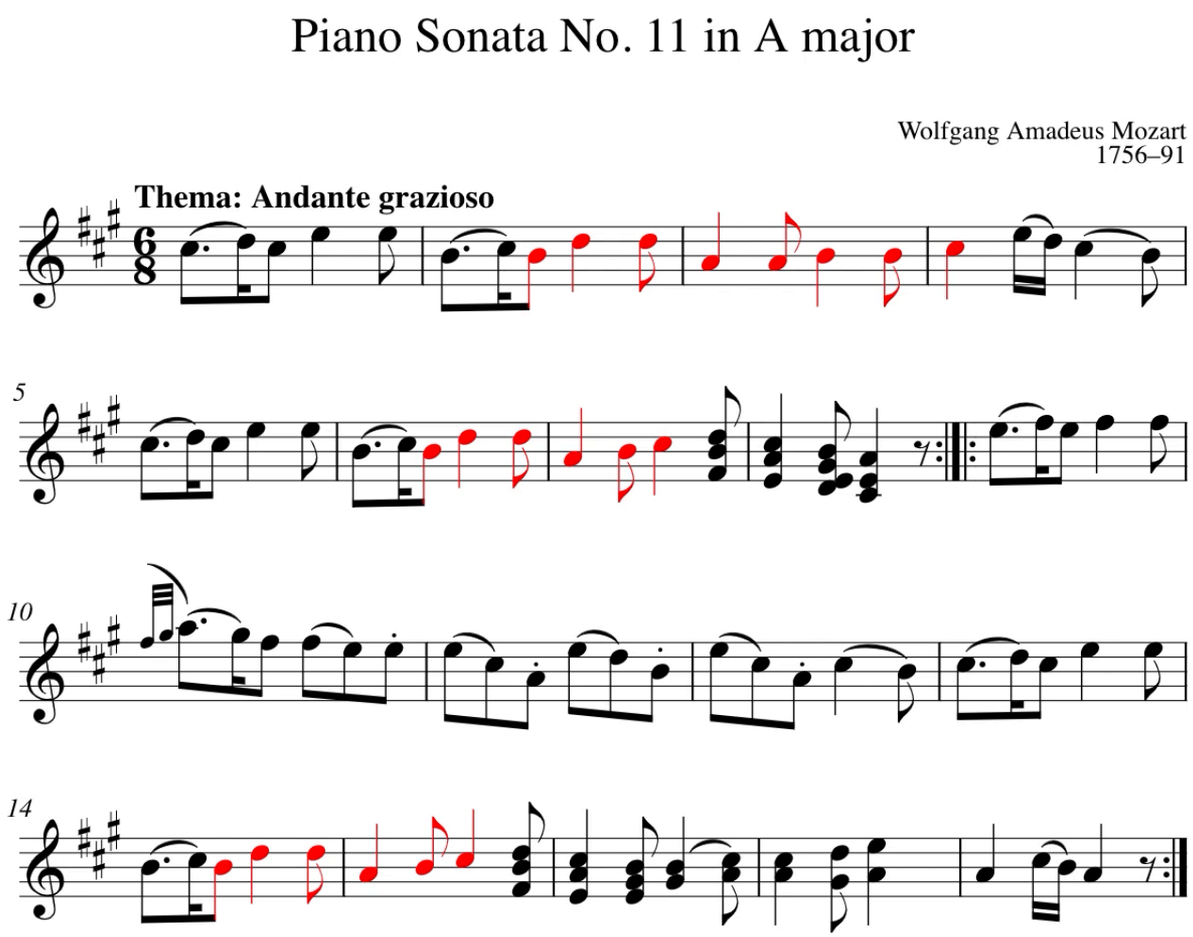
Search Clear Examples

```
<note pname="b" oct="4" dur="8" stem.visible="false"/>
<tuplet xml:id="group0" quantifier="+" num="1" numbase="1" type="quantifie
  <note pname="c" oct="5" dur="4" artic="ten"/>
  <note pname="c" oct="5" dur="8" artic="ten"/>
</tuplet>
<note pname="c" oct="5" dur="4" accid="s" stem.visible="false"/>
```



MEI engraved with Verovio

Music Text Score



Possible improvements

Polyphonic music

Layers (harmony, lyrics…)

Graphical editing

Semantic query encoding

Rendering

Thank you.

https://www.matangover.com/musicquery