

Introducción a la codificación de música utilizando el formato de la *Music Encoding Initiative (MEI)*

Martha E. M. Thomae Elías
Postdoctora del Proyecto ECHOES,
CESEM y Universidade NOVA de Lisboa

Dra. en Tecnología Musical graduada del *Schulich School of Music, McGill University*

TEI 2024: Text, Languages and Communities
07 de Octubre del 2024

Antes de hablar de MEI,
hablemos de codificación de música:

Un ejemplo de codificación de música

Un ejemplo de un formato de codificación musical

The screenshot displays the MuseScore application window. The title bar reads "14_All-mq5_AgnusI". The interface includes a top toolbar with icons for file operations, playback, and editing. Below the toolbar is a palette with various musical symbols like clefs, key signatures, and time signatures. The main workspace shows a musical score for "Missa quarti toni". The score is for four voices: Soprano, Alto, Tenor, and Bass. The lyrics are "Ag - nus de - i, qui tol - lis". The score is in 2/4 time and G major. The title "Missa quarti toni" is centered at the top of the score area. Below the title, there is a note: "From a manuscript (no 9-011) in the Música Colonial archive in Guatemala Cathedral". To the right of this note, it says "Attributed in the manuscript to 'Alegre', probably intended to mean Gregorio Allegri (1582-1652)". The score is labeled "Agnus dei I".



MuseScore

Un ejemplo de un formato de codificación musical

The screenshot shows a music notation software interface with a title bar '14_All-mq5_AgnusI'. The main window displays a score for 'Missa quarti toni' with the subtitle 'Agnus dei I'. The score is for Soprano, Alto, Tenor, and Bass. The lyrics are 'Ag - nus de - i, qui tol - lis'. The interface includes a toolbar with various musical notation tools, a palette on the left with categories like Clefs, Key Signatures, Time Signatures, etc., and a status bar at the bottom.



Dorico



Sibelius

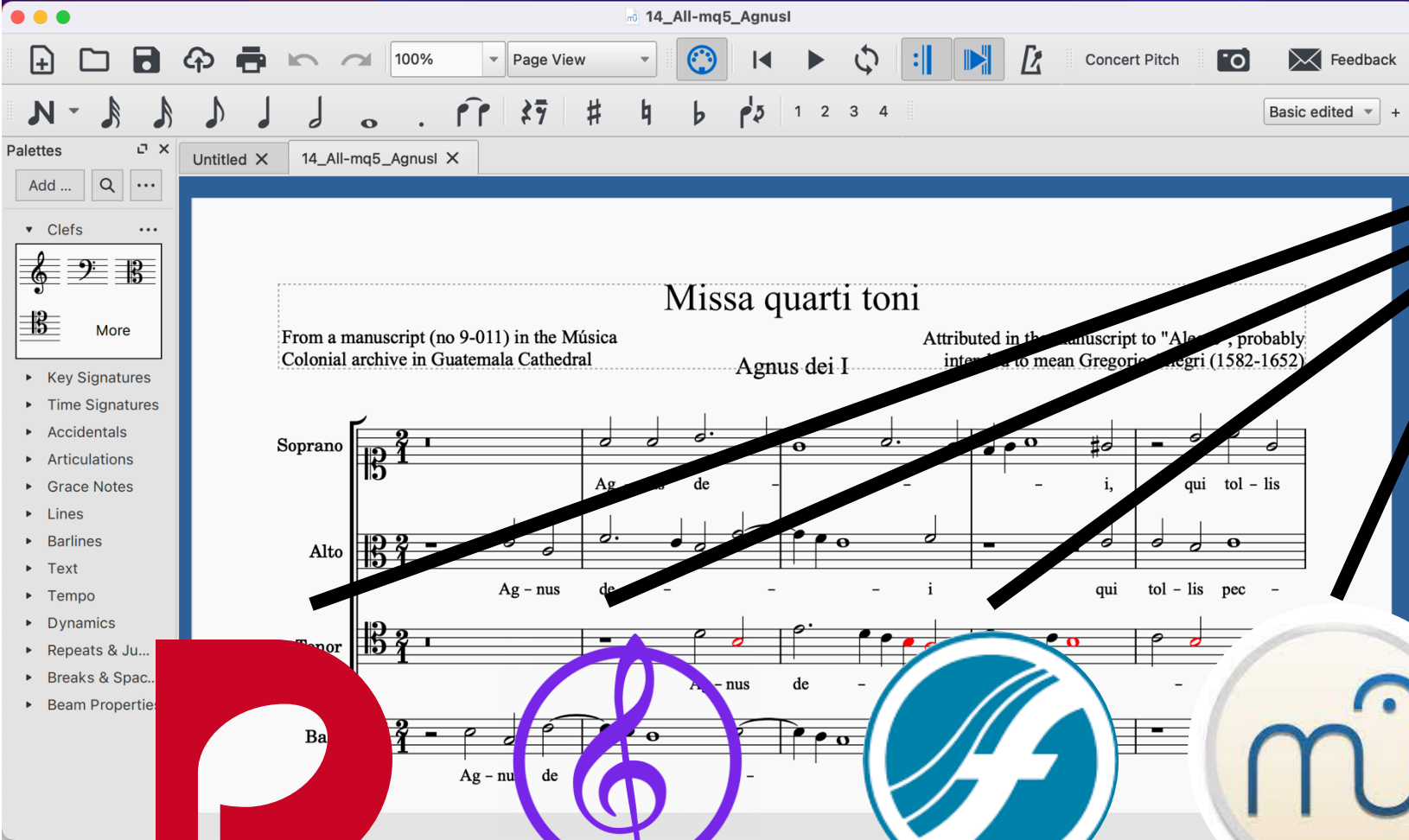


Finale



MuseScore

Un ejemplo de un formato de codificación musical



The screenshot shows a music notation software interface with a score titled "Missa quarti toni". The score is for Soprano, Alto, Tenor, and Bass voices. The lyrics are "Agnus dei I" and "qui tol - lis". The interface includes a toolbar with various musical notation tools and a palette on the left. Four arrows point from the score area to logos: Dorico (red 'D'), Sibelius (purple treble clef), Finale (blue stylized 'F'), and MuseScore (yellow 'm'). The musicXML logo is also present on the right.

Dorico

Sibelius

Finale

MuseScore

musicXML™

Un ejemplo de un formato de codificación musical

The image shows a screenshot of a music notation software interface, likely MuseScore, displaying a score for "Missa quarti toni". The score is for four voices: Soprano, Alto, Tenor, and Bass. The lyrics are "Agnus dei I" and "qui tol - lis". The interface includes a toolbar with various musical notation tools, a palette on the left, and a status bar at the bottom. Arrows point from the software interface to the logos of five music notation formats: Dorico (red logo), Sibelius (purple logo), Finale (blue logo), MuseScore (yellow logo), and musicXML (green logo). The musicXML logo is positioned at the top right, with arrows pointing to it from the software interface and the other logos.

musicXML™

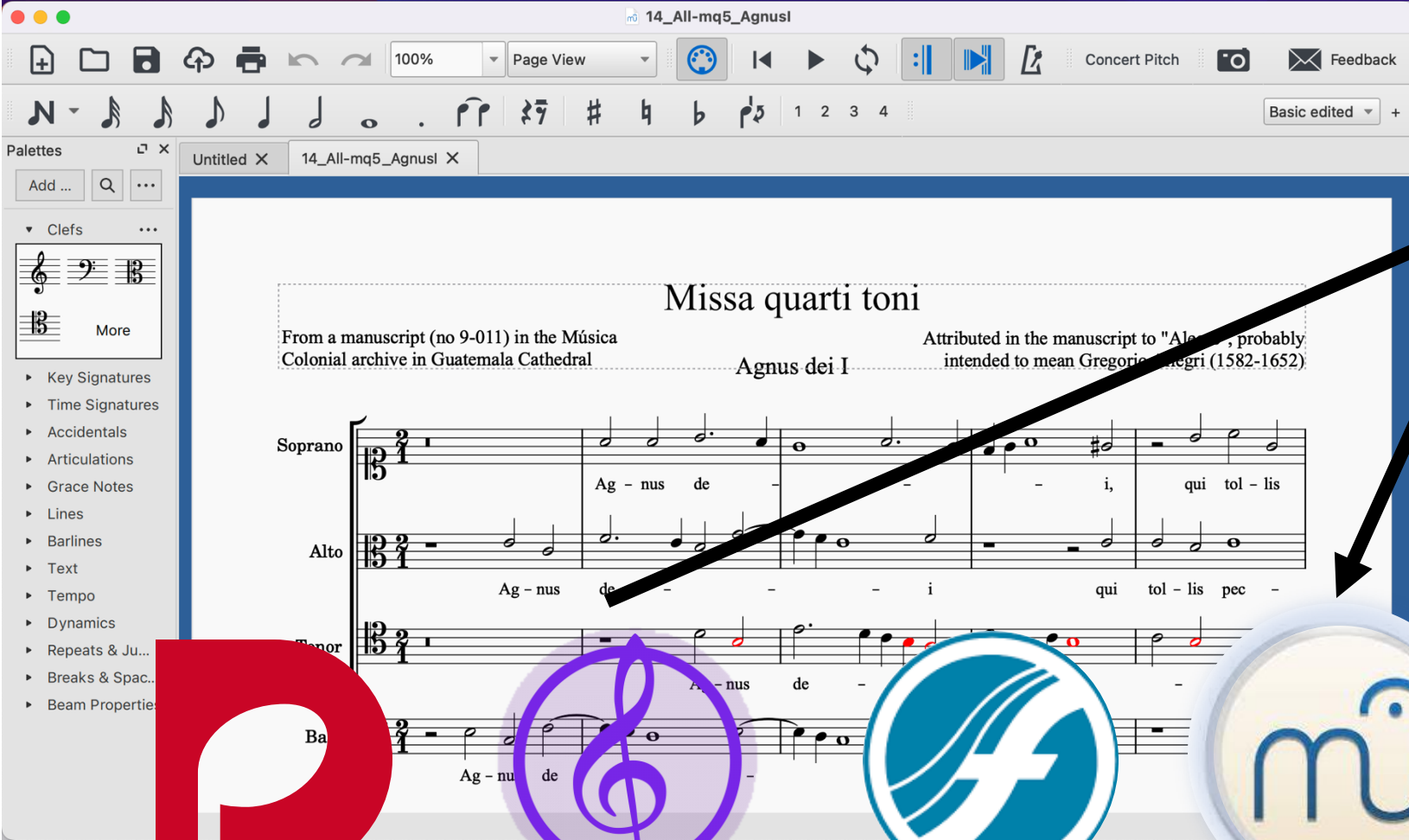
Dorico

Sibelius

Finale

MuseScore

Un ejemplo de un formato de codificación musical



The screenshot shows a music notation software interface with a score titled "Missa quarti toni". The score is for four voices: Soprano, Alto, Tenor, and Bass. The lyrics are "Ag - nus de - i, qui tol - lis". The interface includes a toolbar with various musical notation tools and a palette on the left. Two arrows originate from the score area: one points to the musicXML logo, and the other points to the MuseScore logo.

musicXML™

Dorico

Sibelius

Finale

MuseScore

¿Cómo luce un archivo MusicXML?



```
<measure number="2" width="231.44">
  <note default-x="19.57" default-y="-15.00">
    <pitch>
      <step>A</step>
      <octave>4</octave>
    </pitch>
    <duration>2</duration>
    <voice>1</voice>
    <type>half</type>
    <stem>up</stem>
    <lyric number="1" default-x="6.50" default-y="15.00">
      <syllabic>begin</syllabic>
      <text>Ag</text>
    </lyric>
  </note>
```

- **Formato de intercambio** entre aplicaciones musicales (legible por un ordenador)
- Se basa en **XML** que es un lenguaje de **etiquetado** con una **estructura jerárquica**

¿Qué es el formato de Music
Encoding Initiative (MEI)?

y

¿Por qué usarlo?

Music Encoding Initiative (MEI)

- Formato/lenguaje para codificar documentos con música (al igual que MusicXML)

También se basa en XML:

- Estructura y lenguaje de etiquetado muy parecida a la de MusicXML
- Legible por un ordenador/máquina
- Comunidad que desarrolla dicho formato, muy diversa:
 - Musicología
 - Teoría musical
 - Bibliotecas y archivos musicales
 - Tecnología musical
- El lenguaje MEI responde a las necesidades de esta comunidad

Music Encoding Initiative (MEI)

Además de permitir codificar notación moderna, permite:

- Codificar **notación de música antigua** (por ejemplo: neumas, mensural, tablaturas)
- Codificar **metadata** detallada de una pieza
- Establecer **enlaces** entre la música codificada y la **imagen o audio** de la pieza
- **Ediciones críticas** de música
- Proveer información de **análisis musical** (intervalos melódicos, armonía, etc.)

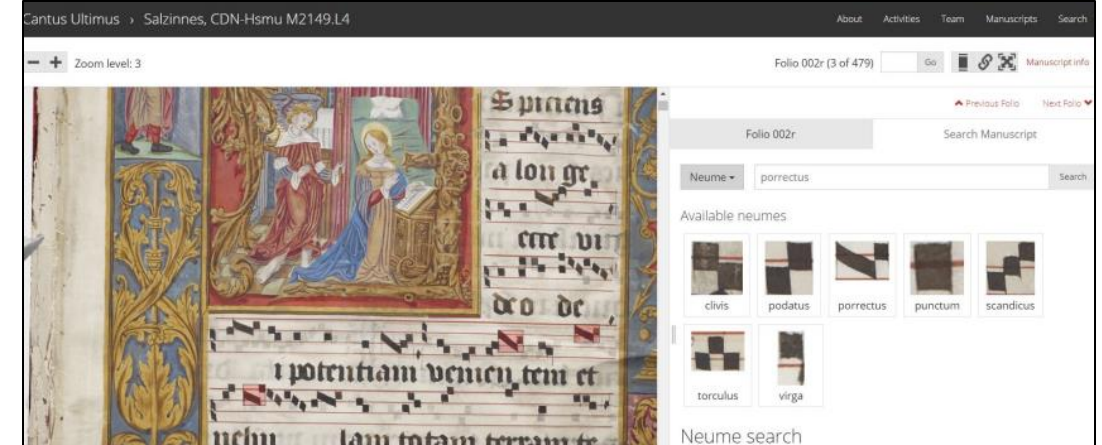
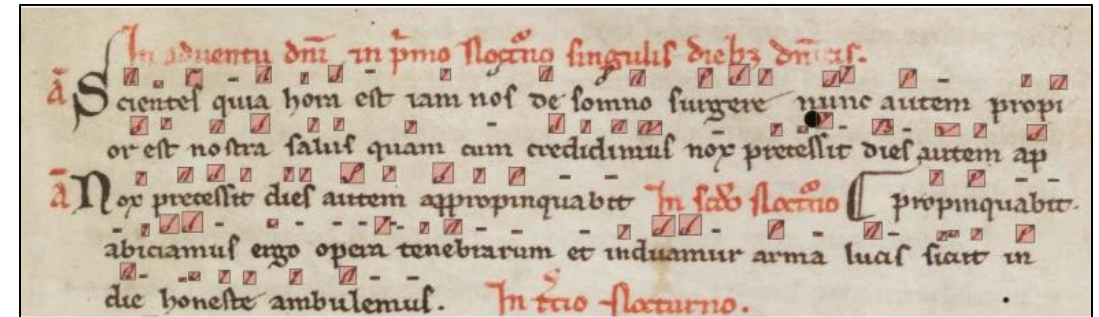


Imagen obtenida en <https://simssa.ca/assets/files/napoles-simssaxvii.pdf>

Music Encoding Initiative (MEI)

Además de permitir codificar notación moderna, permite:

- Codificar **notación de música antigua** (por ejemplo: neumas, mensural, tablaturas)
- Codificar **metadata** detallada de una pieza
- Establecer **enlaces** entre la música codificada y la **imagen o audio** de la pieza
- **Ediciones críticas** de música
- Proveer información de **análisis musical** (intervalos melódicos, armonía, etc.)



Imágenes obtenidas en <https://simssa.ca/assets/files/napoles-simssaxvii.pdf>

En este tutorial cubriremos los aspectos básicos de MEI y codificaremos nuestro primer archivo MEI

Más adelante pueden usar las *Directrices de MEI*
y los *tutoriales* provistos en la página web para
continuar aprendiendo este lenguaje
y usarlo para codificar aspectos de su interés o de su
área de estudio (notación antigua, metadata, etc.)

En este tutorial cubriremos los aspectos básicos de MEI y codificaremos nuestro primer archivo MEI

Sitio web de MEI
<https://music-encoding.org>

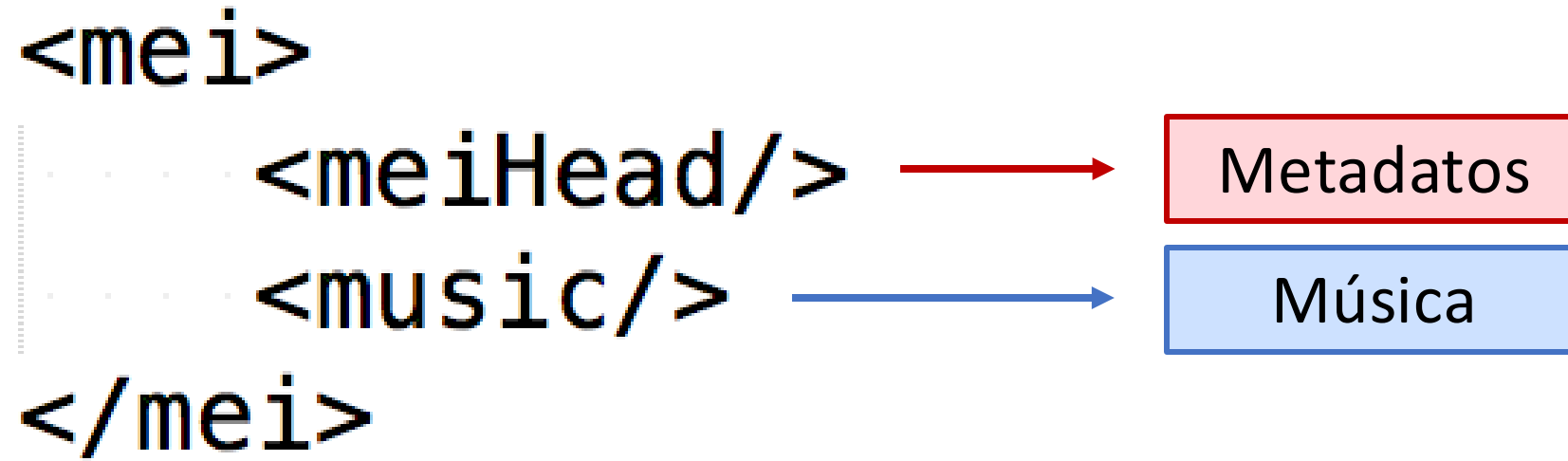
Tutoriales en español:
<https://music-encoding.org/resources/tutorials-ES.html>

(Traducidos del inglés por Alba Bedmar Osma y actualizados por David Rizo,
Universidad de Alicante)

Estructura básica de un archivo MEI



Estructura básica de un archivo MEI





Estructura básica de un archivo MEI

```
<mei>
```

```
  . . . . . <meiHead/> —————→
```

Metadatos

```
  . . . . . <music/>
```

```
</mei>
```



Elementos básicos de <meiHead>

```
<mei>
  <meiHead>
    <fileDesc>
      <titleStmt>
        <title></title>
      </titleStmt>
      <pubStmt/>
    </fileDesc>
  </meiHead>
  <music/>
</mei>
```

TUTORIALES

<https://music-encoding.org/resources/tutorials-ES.html>

PRINCIPIANTES:

Fundamentos de XML y estructura mínima de MEI

Estructura externa básica de un documento MEI válido



Estructura básica de un archivo MEI

```
<mei>  
  . . . . . <meiHead/>  
  . . . . . <music/> —————→ Música  
</mei>
```



Estructura básica de un archivo MEI

```
<mei>
```

```
  <meiHead/>
```

```
  <music/>
```

```
</mei>
```



Música

TUTORIALES

[https://music-encoding.org/
resources/tutorials-ES.html](https://music-encoding.org/resources/tutorials-ES.html)

PRINCIPIANTES: Iniciación rápida

Breve tutorial para empezar a codificar notas

¿Pero cómo llego del elemento
<music> a codificar las notas?

¿Dónde establecimos la clave de sol
del pentagrama que aparece en el
tutorial?

¿Cuál es la estructura interna del
elemento <music>?

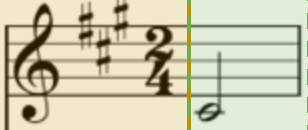
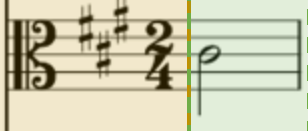
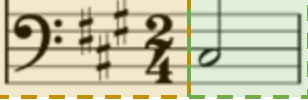


Elementos básicos de <music>

```
<mei>
  <meiHead/>
  <music>
    <body>
      <mdiv>
        <score>
          <scoreDef/>
          <section/>
        </score>
      </mdiv>
    </body>
  </music>
</mei>
```

“Metadatos,” pero
respecto a las voces

Example

Violin	
Viola	
Cello	

Contenido musical
(e.g., notas)


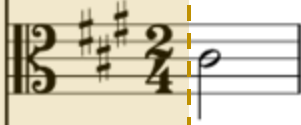



Elementos básicos de <music>

```
<mei>
  <meiHead/>
  <music>
    <body>
      <mdiv>
        <score>
          <scoreDef/>
          <section/>
        </score>
      </mdiv>
    </body>
  </music>
</mei>
```

“Metadatos,” pero
respecto a las voces

Example

Violin	
Viola	
Cello	



<scoreDef> – Información sobre las voces

```
<score>
  <scoreDef>
    <staffGrp>
      <staffDef n="1"/>
      <staffDef n="2"/>
      <staffDef n="3"/>
    </staffGrp>
  </scoreDef>
  <section/>
</score>
```

Información aplicable a nivel de la **partitura (score)**; es decir, aplicable a **todas las voces** (o pentagramas)

- Meter (tipo de compás)
- Key (tonalidad)

Información específica de cada **pentagrama (staff)**; es decir, aplicable a **cada voz**

- Clef (clave)
- Label (nombre del instrumento)
- **Número de líneas en el pentagrama (@lines)**
- **@n**

Imprescindibles

Example

Violin

Viola

Cello

<https://music-encoding.org/guidelines/v5/content/shared.html>



Elementos básicos de <music>

```
<mei>
  <meiHead/>
  <music>
    <body>
      <mdiv>
        <score>
          <scoreDef/>
          <section/>
        </score>
      </mdiv>
    </body>
  </music>
</mei>
```

Example

Violin

Viola

Cello

Contenido musical
(e.g., notas)



<section> – Contenido musical

```
<score>
  <scoreDef/>
  <section>
    <measure n="1">
      <staff n="1">
        <layer>
          <!-- MUSIC WITHIN THE STAFF -->
        </layer>
      </staff>
      <staff n="2"/>
      <staff n="3"/>
    </measure>
    ...
    <measure n="20"/>
  </section>
</score>
```

<https://music-encoding.org/guidelines/v5/content/shared.html>



<section> – Contenido musical

```
<score>
  <scoreDef/>
  <section>
    <measure n="1">
      <staff n="1">
        <layer>
          <!-- MUSIC WITHIN THE STAFF -->
        </layer>
      </staff>
      <staff n="2"/>
      <staff n="3"/>
    </measure>
    ...
    <measure n="20"/>
  </section>
</score>
```

<layer n="1">



<layer n="2">

<https://music-encoding.org/guidelines/v5/content/shared.html>

Estructura General de un Archivo MEI



```
<mei>
  <meiHead>
    <fileDesc>
      <titleStmt>
        <title></title>
      </titleStmt>
      <pubStmt/>
    </fileDesc>
  </meiHead>
  <music>
    <body>
      <mdiv>
        <score>
          <scoreDef/>
          <section/>
        </score>
      </mdiv>
    </body>
  </music>
</mei>
```

“Metadatos,” pero
respecto a las voces

Example



```
<scoreDef>
  <staffGrp>
    <staffDef n="1"/>
    <staffDef n="2"/>
    <staffDef n="3"/>
  </staffGrp>
</scoreDef>
```

TUTORIALES

[https://music-encoding.org/
resources/tutorials-ES.html](https://music-encoding.org/resources/tutorials-ES.html)

AVANZADO:
Codificación de íncipit

Contenido
musical

```
<section>
  <measure n="1">
    <staff n="1">
      <layer>
        <!-- MUSIC WITHIN THE STAFF -->
      </layer>
    </staff>
    <staff n="2"/>
    <staff n="3"/>
  </measure>
  ...
  <measure n="20"/>
</section>
```

¡Qué bien, estoy
aprendiendo MEI!

¿Cómo puedo codificar mi
propio archivo de MEI?
¿Dónde puedo codificarlo?



mei-friend

Hay unos cuantos editores disponibles.
El que usaremos hoy se llama *mei-friend*.

- Se puede usar en línea en un explorador de internet (Por ejemplo: Chrome o Firefox)
- Muestra tanto el código como su renderización
- Permite ver cambios en el renderizado cuando se actualiza el código
- Tiene funciones de auto-completado (útil para saber qué elementos, atributos, y valores son permitidos)
- Permite verificar si el archivo es válido (es decir, si sigue las reglas del esquema de MEI para la codificación de archivos)

<https://mei-friend.mdw.ac.at/>

La Cucaracha

Arr. Gustavo Martín

lento

p La cu-ca-ra-cha, la cu-ca-ra-cha ya no pue-de ca-mi-nar

p La cu-ca-ra-cha, la cu-ca-ra-cha ya no pue-de ca-mi-nar la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha ya no pue-de ca-mi-nar la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha ya no pue-de ca-mi-nar

Allegro *4a. vez accel.*

la cu-ca-ra-cha, la cu-ca-ra-cha ya no pue-de ca-mi-nar por que no

la cu-ca-ra-cha, la cu-ca-ra-cha ya no pue-de ca-mi-nar por que no

La la la la la la

f ya no pue-de ca-mi-nar Dom dom la la

<https://mei-friend.mdw.ac.at/>

The image displays a musical score for the song "La Cucaracha" in 3/4 time, featuring four staves (three treble and one bass) with lyrics and dynamic markings. The score is divided into three measures, numbered 1, 2, and 3. The first measure is marked with a dynamic of *p* (piano). The lyrics are "La cu-ca- ra- cha, la cu-ca- ra- cha". The second measure is marked with a dynamic of *p* (piano). The lyrics are "La cu-ca- ra- cha, la cu-ca- ra- cha". The third measure is marked with a dynamic of *p* (piano). The lyrics are "La cu-ca- ra- cha, la cu-ca- ra- cha". The score is written in G major (one sharp) and 3/4 time. The first measure is marked with a dynamic of *p* (piano). The lyrics are "La cu-ca- ra- cha, la cu-ca- ra- cha". The second measure is marked with a dynamic of *p* (piano). The lyrics are "La cu-ca- ra- cha, la cu-ca- ra- cha". The third measure is marked with a dynamic of *p* (piano). The lyrics are "La cu-ca- ra- cha, la cu-ca- ra- cha".

EJERCICIO: Codificar los primeros tres compases de La Cucaracha

<https://mei-friend.mdw.ac.at/>

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The key signature is one sharp (F#). The score is divided into three measures, numbered 1, 2, and 3. Each staff begins with a piano (*p*) dynamic marking. The lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" are written below the notes. The first staff is in treble clef, the second and third are in treble clef with a brace on the left, and the fourth is in bass clef. The melody is simple and repetitive, with the lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" repeated across the three measures.

Inicio

Paso 0: Plantilla

Los editores de XML (tal como *mei-friend*) cuentan con **funciones de auto-completado**—desplegando los elementos, atributos y valores permitidos en el archivo—y de **validación**—verificando si el archivo se conforma a las reglas de codificación del esquema de MEI

Es necesario incluir las siguientes tres líneas antes del elemento raíz <mei>
INSTRUCCIONES DE PROCESAMIENTO DEL ARCHIVO XML

1	<?xml version="1.0" encoding="UTF-8"?>
2	<?xml-model href="https://music-encoding.org/schema/5.0/mei-all.rng" type="application/xml" schematypens="http://relaxng.org/ns/structure/1.0"?>
3	<?xml-model href="https://music-encoding.org/schema/5.0/mei-all.rng" type="application/xml" schematypens="http://purl.oclc.org/dsdl/schematron"?>

Esquemas para las diferentes notaciones que se pueden codificar en MEI:
<https://music-encoding.org/resources/schemas.html>

<https://mei-friend.mdw.ac.at/>

The image displays a musical score for the song "La cucaracha" in 3/4 time, marked with a key signature of one sharp (F#). The score is arranged for four staves, each with a treble or bass clef. The lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" are written below the notes. The dynamics are marked with a *p* (piano) symbol. The score is divided into three measures, numbered 1, 2, and 3 at the top. The first measure is marked with a *p* and a *La* below the first note. The second measure is marked with a *p* and a *ra* below the first note. The third measure is marked with a *p* and a *cha* below the first note. The score is written in a simple, clear style, suitable for educational purposes.

Inicio

Paso 0: Plantilla

The image displays a musical score for the song "La cucaracha" in 3/4 time, marked with a key signature of one sharp (F#). The score consists of four staves. The first staff is highlighted with a light purple background and contains the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" with a first voice part indicated by a "1" above the staff. The second and third staves also contain the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" and are marked with a piano (*p*) dynamic. The fourth staff, in bass clef, contains the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" and is also marked with a piano (*p*) dynamic. The score is divided into three measures, with the first measure starting with a treble clef and a key signature of one sharp, and the subsequent measures continuing the melody.

Empecemos con la primera voz (pentagrama # 1)

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first staff is highlighted with a yellow background and a dashed orange border, indicating it is the first voice. The second and third staves are grouped by a brace on the left and have a green background with a dashed green border. The fourth staff is the bass line. Each staff begins with a treble clef (except for the bass line which has a bass clef), a key signature of one sharp (F#), and a 3/4 time signature. The lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" are written below the notes. The first staff includes a dynamic marking *p* (piano) and a measure number 1. The second and third staves also include a dynamic marking *p*. The fourth staff includes a dynamic marking *p*. The score is divided into measures by vertical bar lines, with measure numbers 1, 2, and 3 indicated above the first three staves.

Empecemos con la primera voz (pentagrama # 1)

<https://mei-friend.mdw.ac.at/>

1 2 3

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

Vamos a la parte de <staffDef> y <scoreDef> que define la información general de las voces

The image displays a musical score for the song "La cucaracha" in 3/4 time, marked with a treble clef and a key signature of one sharp (F#). The score consists of four staves, each with a vocal line and the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha". The first staff is highlighted with a yellow dashed border and a red oval around the treble clef. The lyrics are written below the notes, and the piece is marked with a *p* (piano) dynamic. The score is divided into three measures, numbered 1, 2, and 3 at the top. The first measure contains the first two notes of the melody, the second measure contains the next two notes, and the third measure contains the final note and a repeat sign.

Paso 1: Definir el primer pentagrama (staffDef)

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first measure of the score is highlighted with a red dashed border and a yellow background. The lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" are written below the staves. The score is marked with a piano (*p*) dynamic. The first measure is marked with a '0' above the staff, and the subsequent measures are marked with '1', '2', and '3' above the staff. The score is written in treble and bass clefs, with a key signature of one sharp (F#).

Paso 2: Definir la partitura (scoreDef)

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first staff is highlighted with a yellow dashed box. The score is divided into three measures, each containing the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha". The first measure is marked with a dynamic of *p* (piano). The second and third measures are marked with a dynamic of *p* (piano). The score is written in treble and bass clefs, with a key signature of one sharp (F#). The first staff is marked with a "D" and a "1" above it. The second and third staves are marked with a "2" and a "3" above them. The fourth staff is marked with a "4" and a "3" above it. The lyrics are written below the notes, with hyphens indicating syllable placement. The dynamic marking *p* is placed below the first note of each measure.

Seguimos con la primera voz (pentagrama # 1)

<https://mei-friend.mdw.ac.at/>

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first staff is highlighted with a green dashed border and contains the lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" with measures numbered 1, 2, and 3. The second and third staves also contain the lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha". The fourth staff contains the lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha". The score is marked with a piano (*p*) dynamic. The key signature is one sharp (F#) and the time signature is 3/4.

**Vamos a la parte de <section> donde está
el contenido musical de la voz**

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first measure of the first staff is highlighted in green. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The score includes a key signature of one sharp (F#) and a dynamic marking of *p* (piano). The first measure is marked with a '1' above it, and the subsequent measures are marked with '2' and '3' above them. The score is written in a single system with four staves, each containing a treble or bass clef and a key signature of one sharp. The lyrics are written below the staves, with hyphens indicating syllable placement over notes. The first measure is highlighted in green, and the subsequent measures are marked with '2' and '3' above them.

Paso 3: Primer compás

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves (three treble and one bass). The key signature is one sharp (F#). The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The first measure is marked with a "D" and a "p" (piano) dynamic. The second measure is highlighted with a green background and contains a comma. The third measure is marked with a "2" and the fourth with a "3".

1 2 3

p La cu-ca- ra- cha, la cu-ca- ra- cha

p La cu-ca- ra- cha, la cu-ca- ra- cha

p La cu-ca- ra- cha, la cu-ca- ra- cha

p La cu-ca- ra- cha, la cu-ca- ra- cha

Paso 4: Segundo compás

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first staff is in treble clef with a key signature of one sharp (F#) and a dynamic marking of *p* (piano). The second and third staves are also in treble clef with the same key signature and dynamic marking. The fourth staff is in bass clef with the same key signature and dynamic marking. The lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" are written below each staff. The score is divided into three measures, numbered 1, 2, and 3. The third measure is highlighted with a green background. The melody consists of eighth and quarter notes, and the bass line consists of quarter notes.

Paso 5: Tercer compás

The image shows a musical score for the song "La cucaracha" in 3/4 time, key of D major. It consists of four staves. The first staff is for the vocal melody, and the other three are for piano accompaniment. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The score is divided into three measures, numbered 1, 2, and 3. The second staff is highlighted with a purple background. The piano part consists of a simple bass line in the left hand and a treble line in the right hand. The tempo is marked with a quarter note and the dynamic is *p* (piano).

1 2 3

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

Empecemos con la segunda voz (pentagrama # 2)

0 1 2 3

p La cu-ca- ra-cha, la cu-ca- ra-cha

p La cu-ca- ra-cha, la cu-ca- ra-cha

p La cu-ca- ra-cha, la cu-ca- ra-cha

p La cu-ca- ra-cha, la cu-ca- ra-cha

Empecemos con la segunda voz (pentagrama # 2)

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first staff is highlighted with a yellow background and a red dashed circle around the treble clef and key signature. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha" and are repeated across the four staves. The score is marked with a *p* (piano) dynamic. The first staff is marked with a *p* and the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha". The second staff is marked with a *p* and the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha". The third staff is marked with a *p* and the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha". The fourth staff is marked with a *p* and the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha". The score is divided into three measures, numbered 1, 2, and 3. The first measure contains the first staff, the second measure contains the second staff, and the third measure contains the third and fourth staves.

Paso 6: Definir el segundo pentagrama (staffDef con @n=2)

<https://mei-friend.mdw.ac.at/>

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first staff is marked with a treble clef, a key signature of one sharp (F#), and a 3/4 time signature. The lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" are written below the notes. The second staff is highlighted with a green dashed border and contains the same lyrics. The third and fourth staves also contain the lyrics. The score is divided into three measures, numbered 1, 2, and 3 at the top. The lyrics are "La cu-ca- ra- cha, la cu-ca- ra- cha" for the first measure, "La cu-ca- ra- cha, la cu-ca- ra- cha" for the second measure, and "La cu-ca- ra- cha, la cu-ca- ra- cha" for the third measure. The dynamics are marked with a *p* (piano) in each measure.

Proseguimos con las notas (vamos a la parte de <section>)

Paso 7: Crear el segundo pentagrama (staff con @n=2)

<https://mei-friend.mdw.ac.at/>

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first measure of the first staff is highlighted in green. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The score includes a key signature of one sharp (F#) and a dynamic marking of *p* (piano). The staves are numbered 1, 2, and 3, indicating measures. The first measure of the first staff is highlighted in green.

Paso 8: Rellenar el primer compás
(mismas notas que el primer pentagrama, copiar y pegar)

<https://mei-friend.mdw.ac.at/>

The image shows a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first staff is marked with a treble clef, a key signature of one sharp (F#), and a 3/4 time signature. The lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" are written below the staff. The second staff is marked with a treble clef, a key signature of one sharp (F#), and a 3/4 time signature. The lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" are written below the staff. The third staff is marked with a treble clef, a key signature of one sharp (F#), and a 3/4 time signature. The lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" are written below the staff. The fourth staff is marked with a bass clef, a key signature of one sharp (F#), and a 3/4 time signature. The lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" are written below the staff. The second and third measures of the second staff are highlighted in green.

Paso 9: Rellenar el segundo y tercer compás
(lo mismo, mismas notas que el primer pentagrama, copiar y pegar)

0 1 2 3

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

Empecemos con la tercera voz (pentagrama # 3)

The image shows a musical score for the song "La cucaracha" in 3/4 time, key of D major. It consists of four staves. The first three staves are for voices, and the fourth is for a piano accompaniment. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The score is divided into three measures, numbered 1, 2, and 3. The first measure is marked with a piano (*p*) dynamic. The third staff is highlighted with a green dashed box, and the first measure of this staff is also highlighted with an orange solid box.

0 1 2 3

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

Empecemos con la tercera voz (pentagrama # 3)

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four staves. The first three staves are in treble clef, and the fourth is in bass clef. The key signature is one sharp (F#). The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha" repeated across the staves. The first staff is marked with a piano (*p*) dynamic. The second and third staves are also marked with a piano (*p*) dynamic. The fourth staff is marked with a piano (*p*) dynamic. The score is divided into three measures, numbered 1, 2, and 3. A yellow dashed box highlights the third staff, and a red oval highlights the treble clef and key signature of the third staff.

Paso 10: Definir el tercer pentagrama (staffDef con @n=3)

The image shows a musical score for the song "La cucaracha" in 3/4 time, key of D major. It consists of four staves. The first three staves are in treble clef, and the fourth is in bass clef. The melody is played on a piano (*p*). The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The third staff is highlighted with a green dashed box. The score is divided into three measures, numbered 1, 2, and 3 at the top.

Proseguimos con las notas
(mismas que en los dos pentagramas superiores, pero una octava abajo)

<https://mei-friend.mdw.ac.at/>

The image shows a musical score for the song "La cucaracha" in 3/4 time, key of D major. It consists of four staves. The first three staves are for voices (Soprano, Alto, and Tenor/Bass), and the fourth is for a keyboard accompaniment. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The third staff is highlighted with a green dashed box, indicating it is the focus of the instruction. The score is divided into three measures, numbered 1, 2, and 3 at the top. The first measure starts with a treble clef, a key signature of one sharp (F#), and a 3/4 time signature. The second and third measures continue the melody. The lyrics are written below the notes, with hyphens indicating syllable placement. The dynamic marking *p* (piano) is present at the beginning of each staff.

Paso 11: Crear el tercer pentagrama (staff con @n=3) y rellenar todos los compases (mismas notas que la segunda voz, copiar y pegar)

The image displays a musical score for the song "La cucaracha" in 3/4 time, marked with a key signature of one sharp (F#). The score consists of four staves. The first three staves are in treble clef, and the fourth is in bass clef. Each staff begins with a piano (*p*) dynamic marking. The lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha" are written below the notes. The third staff is highlighted with a green dashed border. Above the first staff, there are measure numbers 1, 2, and 3, with a comma between 1 and 2, and a comma between 2 and 3.

Paso 12: Cambiar la octava de las notas

0 1 2 3

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

Empecemos con la cuarta voz (pentagrama # 4)

The image displays a musical score for the song "La cucaracha" in 3/4 time, featuring four voices. The score is written on four staves, each with a treble clef and a key signature of one sharp (F#). The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The first three staves are grouped together by a brace on the left. The fourth staff is highlighted with a green dashed border. The first staff is also highlighted with an orange dashed border. The score is divided into three measures, numbered 1, 2, and 3 at the top. The first measure is marked with a *p* (piano) dynamic. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The second measure is marked with a *p* (piano) dynamic. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The third measure is marked with a *p* (piano) dynamic. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha".

Empecemos con la cuarta voz (pentagrama # 4)

0 1 2 3

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

Paso 13: Definir el cuarto pentagrama (staffDef con @n=4)

0 1 2 3

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

p La cu-ca-ra-cha, la cu-ca-ra-cha

**Proseguimos con las notas
(mismas que en la tercera voz)**

<https://mei-friend.mdw.ac.at/>

0 1 2 3

p La cu-ca- ra- cha, la cu-ca- ra- cha

p La cu-ca- ra- cha, la cu-ca- ra- cha

p La cu-ca- ra- cha, la cu-ca- ra- cha

p La cu-ca- ra- cha, la cu-ca- ra- cha

Paso 14: Crear el cuarto pentagrama (staff con @n=4) en cada <measure> y rellenar estos compases (mismas notas que la tercera voz, copiar y pegar)

Recursos

- Sitio principal: <https://music-encoding.org/>
- Directrices: <https://music-encoding.org/guidelines/v5/content/index.html>
- Tutoriales: <https://music-encoding.org/resources/tutorials.html>
 - Versión en español: <https://music-encoding.org/resources/tutorials-ES.html>
- Herramientas: <https://music-encoding.org/resources/tools.html>,
incluyendo *mei-friend*, *Verovio* y *MuseScore*
- Ejemplos: <https://github.com/music-encoding/sample-encodings>
 - Para la versión actual (MEI 5.0): https://github.com/music-encoding/sample-encodings/tree/main/MEI_5.0



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NOVA FCSH

FACULDADE DE CIÊNCIAS SOCIAIS E HUMANAS
UNIVERSIDADE NOVA DE LISBOA

¡Muchas gracias!

martha.thomae@fcsch.unl.pt



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