

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

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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' by '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 'Clefs', 'Key Signatures', 'Time Signatures', 'Accidentals', 'Articulations', 'Grace Notes', 'Lines', 'Barlines', 'Text', 'Tempo', 'Dynamics', 'Repeats & Ju...', 'Breaks & Spac...', and 'Beam Properties'. The score is in 2/4 time and G major.



Dorico



Sibelius

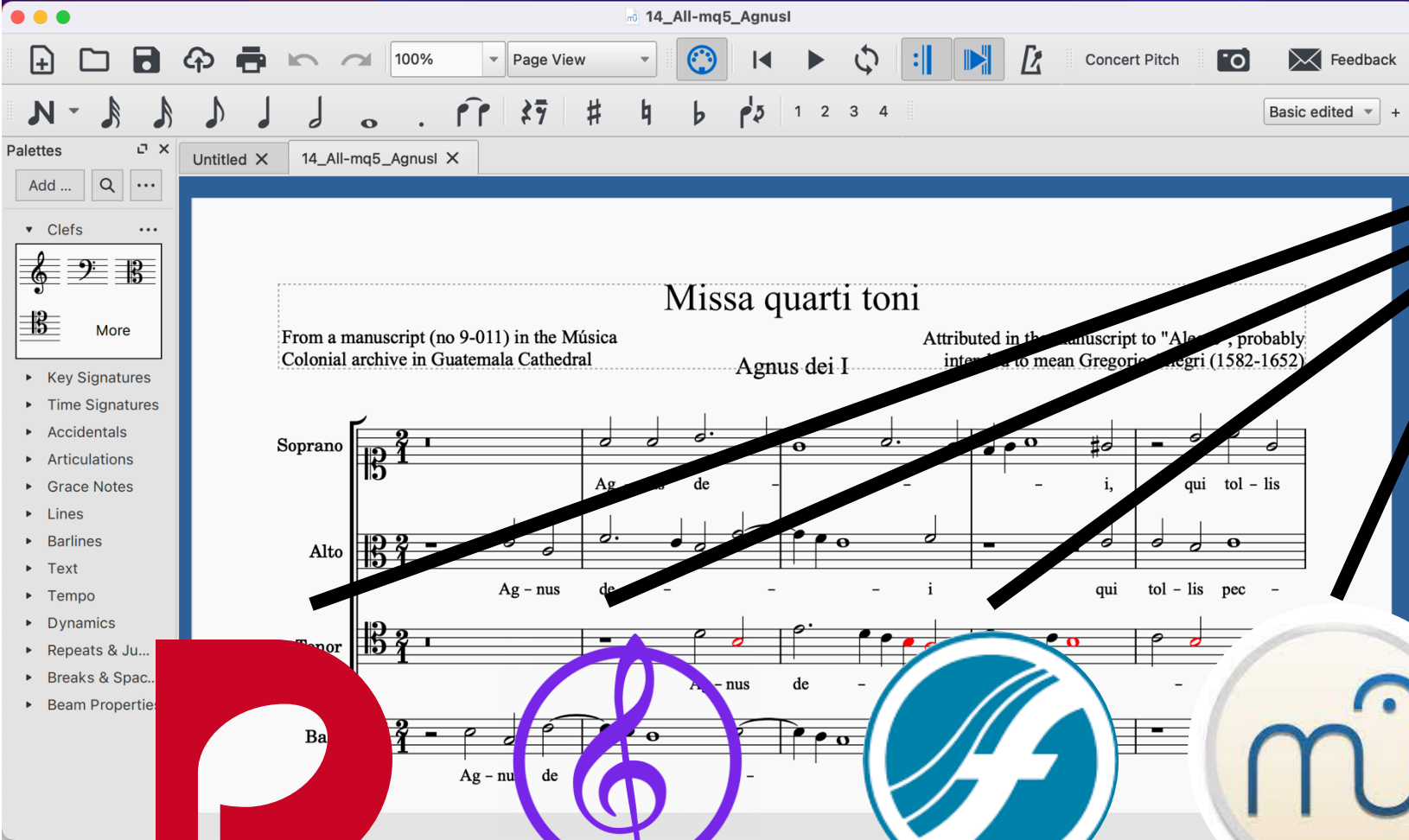


Finale



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 "Agnus dei I" and is attributed to "Agnus dei I" (probably intended to mean Gregorio Allegri (1582-1652)). The score is for Soprano, Alto, Tenor, and Bass. The interface includes a toolbar with various notation tools, a palette on the left, and a status bar at the bottom. Four arrows point from the score area to logos: Dorico (red 'D'), Sibelius (purple treble clef), Finale (blue '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 Soprano, Alto, Tenor, and Bass parts. The title "Missa quarti toni" is centered at the top. Below the title, there is a note: "From a manuscript (no 9-011) in the Música Colonial archive in Guatemala Cathedral". The score is in 2/4 time and G major. The lyrics are "Agnus dei I" and "qui tol - lis pec -".

Arrows point from the score to the logos of five music notation software packages:

- Dorico** (Red logo)
- Sibelius** (Purple logo)
- Finale** (Blue logo)
- MuseScore** (Yellow logo)
- musicXML** (Green logo)

Un ejemplo de un formato de codificación musical

The image shows a screenshot of a music notation software interface, likely MuseScore, displaying a score titled "Missa quarti toni". The score is for a four-part setting of the "Agnus dei I". The interface includes a toolbar at the top with various notation tools, a left sidebar with a "Palettes" panel showing musical symbols like clefs and accidentals, and a main score area with staves for Soprano, Alto, Tenor, and Bass. The score text includes "From a manuscript (no 9-011) in the Música Colonial archive in Guatemala Cathedral" and "Attributed in the manuscript to 'Alejo', probably intended to mean Gregorio Allegri (1582-1652)".

Four logos are overlaid at the bottom, each with an arrow pointing from the score area to the musicXML logo:

- Dorico** (Red logo)
- Sibelius** (Purple logo)
- Finale** (Blue logo)
- MuseScore** (Yellow logo)

The musicXML logo is located at the top right of the image, featuring a green and white circular icon and the text "musicXML™".

¿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.)

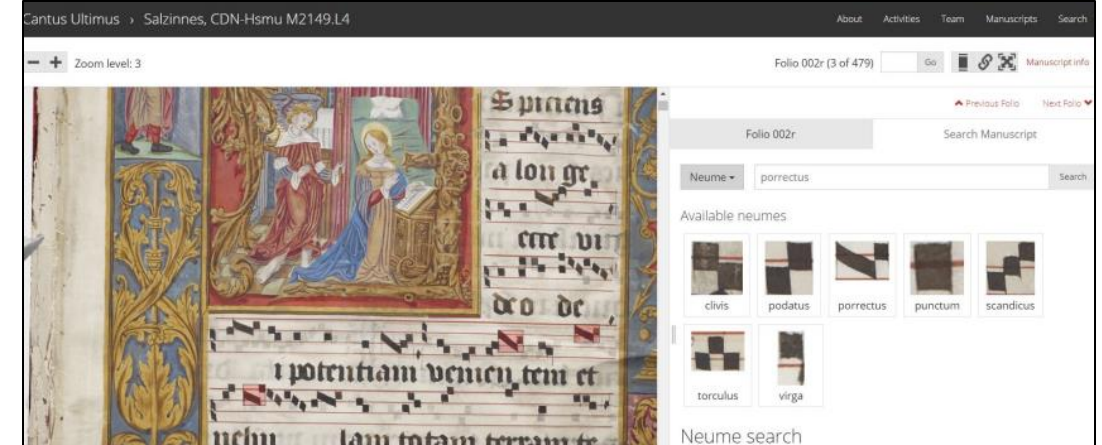
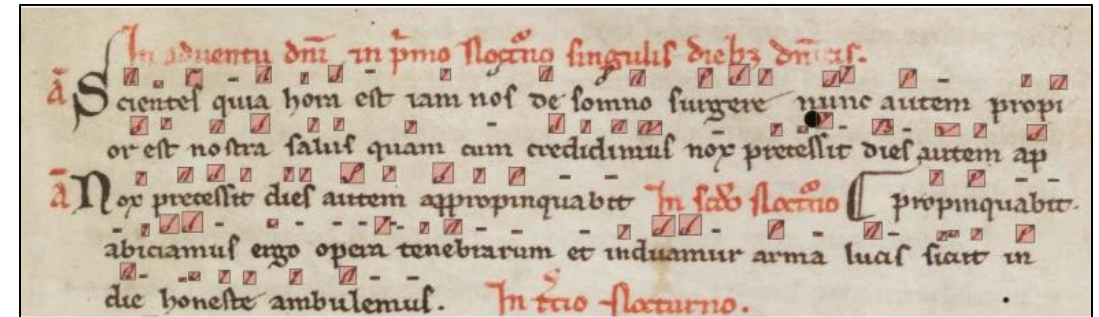


Imagen obtenida en <https://simssa.ca/assets/files/napoles-simssaxvii.pdf>

Music Encoding Initiative (MEI)

Además de permitir codificar notación moderna, permite:

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- 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>

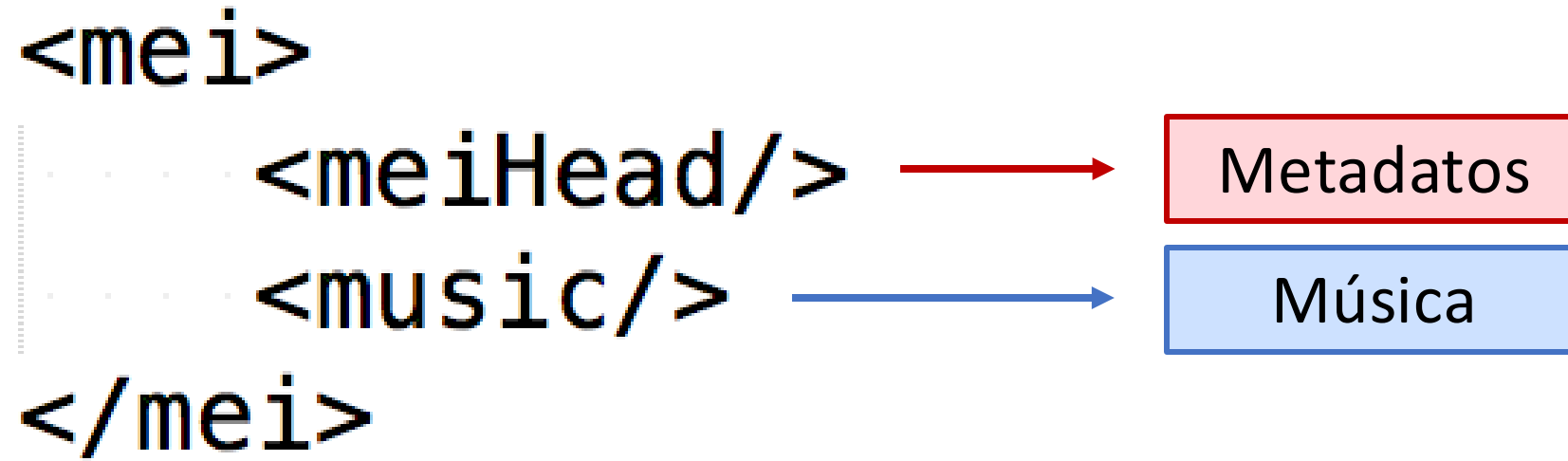
Tutoriales en español:
<https://music-encoding.org/resources/tutorials-ES.html>

(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>?

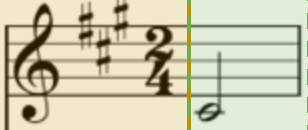
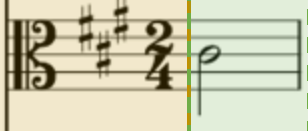
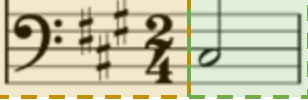


Elementos básicos de <music>

```
<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

Violin

Viola

Cello

```
<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

0 1 2 3 4 5

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 6 7 8 9 10 11

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. The key signature is one sharp (F#). The score is divided into three measures, numbered 1, 2, and 3 at the top. Each staff begins with a dynamic marking of *p* (piano). The lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" are written below the notes on each staff. The notation includes various note values (quarter, eighth, and sixteenth notes) and rests, with some notes marked with accents. The staves are arranged in a system, with the first three staves grouped by a brace on the left and the fourth staff below them.

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, 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 *0* above the first staff. The second measure is marked with a *p* and a *1* above the first staff. The third measure is marked with a *p* and a *2* above the first staff. The fourth measure is marked with a *p* and a *3* above the first staff.

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, 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 dynamic marking of *p* (piano). 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

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 light purple background. The lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" are written below each staff. The first staff is marked with a *p* (piano) dynamic. The score is divided into three measures, with the first measure starting with a key signature of one sharp (F#) and a time signature of 3/4. The first staff is marked with a *p* (piano) dynamic. The score is divided into three measures, with the first measure starting with a key signature of one sharp (F#) and a time signature of 3/4. The first staff is marked with a *p* (piano) dynamic.

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 starting point for the first voice. 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 *f* (forte). The score is written in G major (one sharp) and 3/4 time. The first staff is a treble clef, and the other three are bass clefs. The lyrics are written below the notes, with hyphens indicating syllable placement. The first staff is labeled with a "D" in a circle, and the other three are labeled with "1", "2", and "3" respectively.

Empecemos con la primera voz (pentagrama # 1)

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

1 2 3

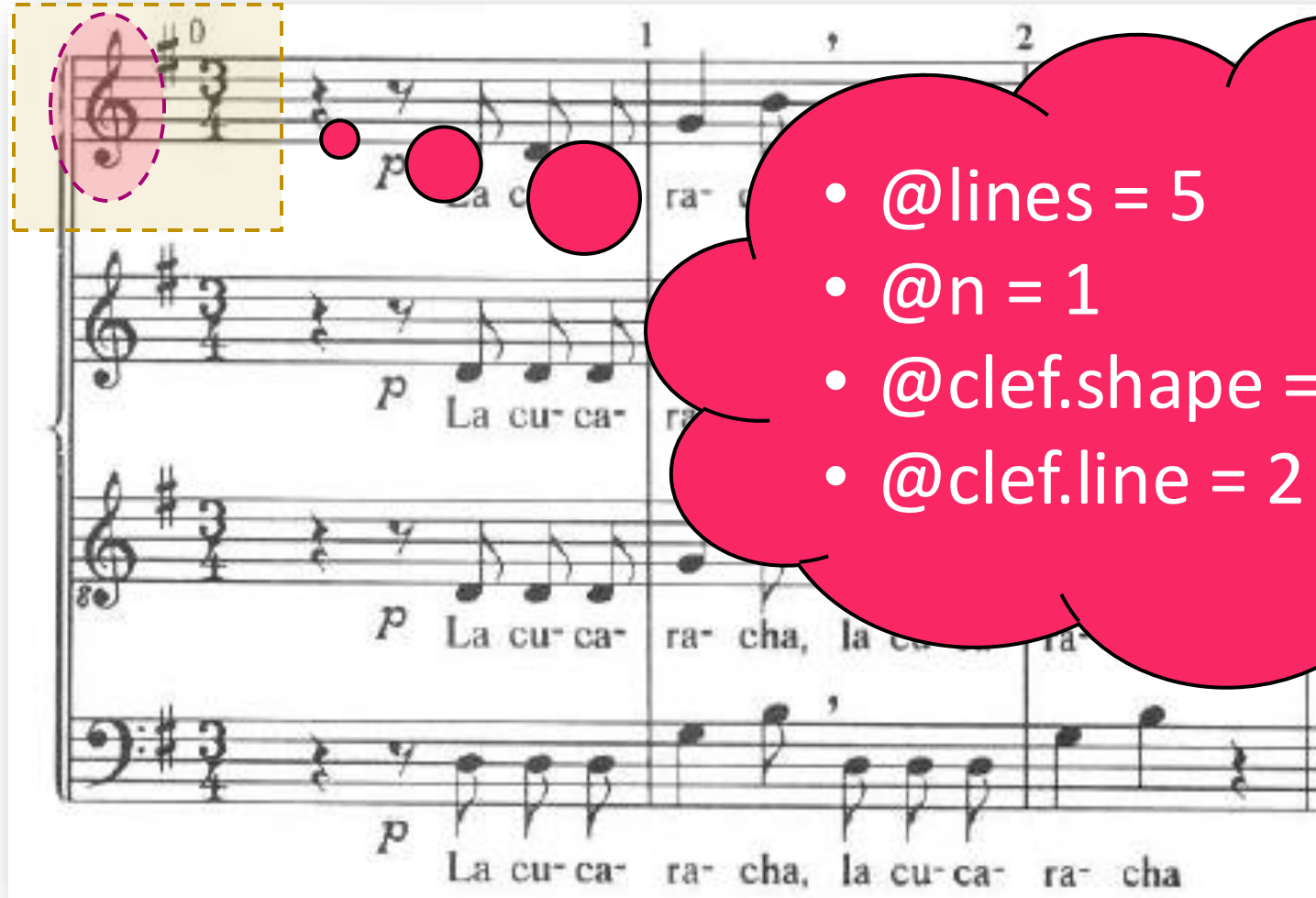
p La cu-ca- ra- cha, la cu-ca- ra- cha

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

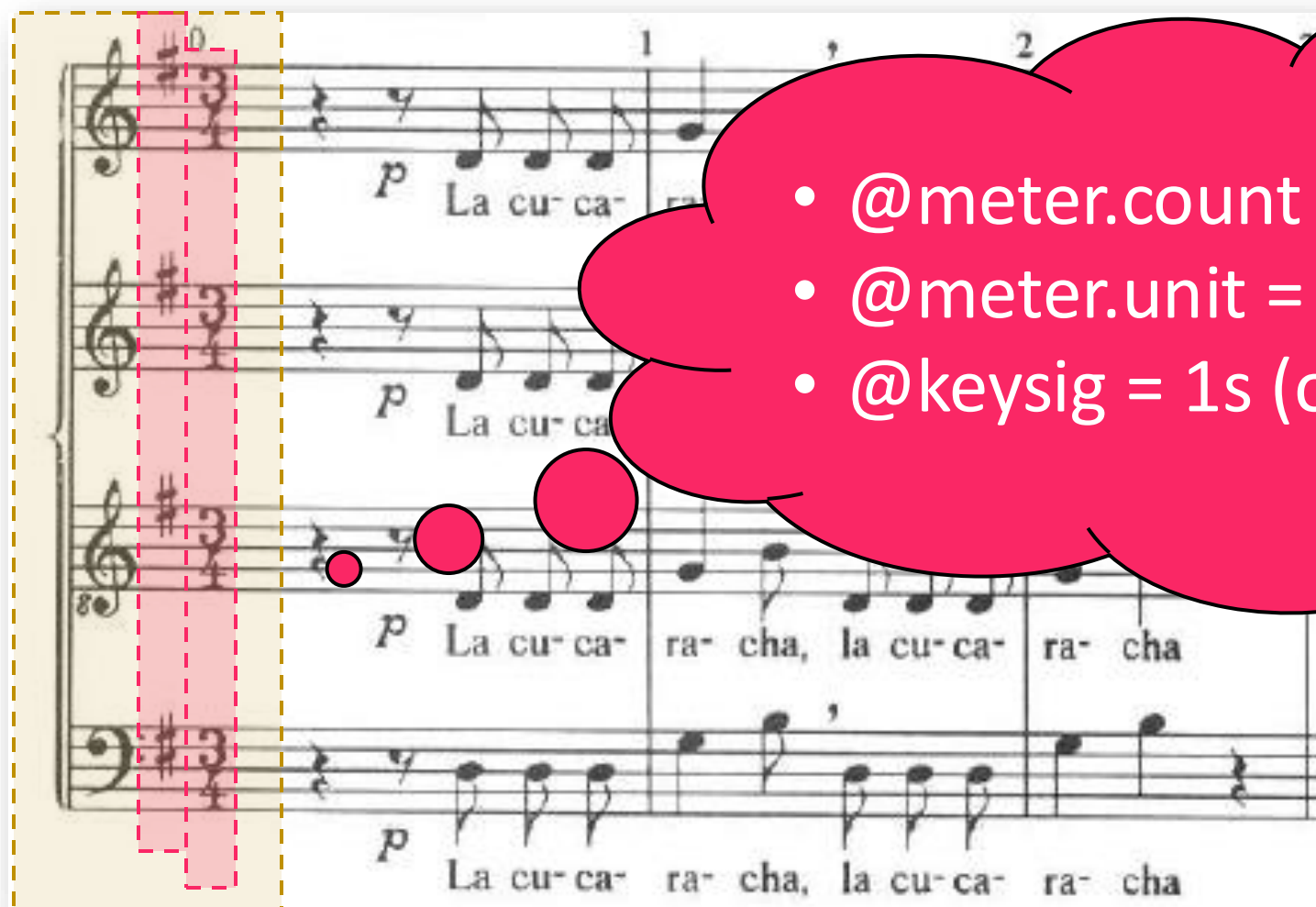
Vamos a la parte de <staffDef> y <scoreDef> que define la información general de las voces



The image shows a musical score for the song 'La Cucaracha' in 3/4 time, key of D major. The score is written for four staves: three treble staves and one bass staff. The first staff is highlighted with a yellow dashed box, and its first measure is circled in pink. A large pink cloud overlay on the right side of the image contains the following LilyPond code:

- `@lines = 5`
- `@n = 1`
- `@clef.shape = G`
- `@clef.line = 2`

Paso 1: Definir el primer pentagrama (staffDef)



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

- @meter.count = 3
- @meter.unit = 4
- @keysig = 1s (one sharp)

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 background and a dashed orange border. The second staff is highlighted with a green background and a dashed green border. The third and fourth staves are not highlighted. The score is divided into three measures, numbered 1, 2, and 3. The lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha" are written below the notes. The dynamic marking *p* (piano) is present at the beginning of each staff. The key signature is one sharp (F#).

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

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 written in treble and bass clefs, with a key signature of one sharp (F#) and a dynamic marking of *p* (piano).

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

The image shows a musical score for the song 'La cucaracha' in 3/4 time. It consists of four staves: three vocal staves (soprano, alto, and tenor) and one bass line. The lyrics are 'La cu-ca-ra-cha, la cu-ca-ra-cha'. A green callout box is overlaid on the score, containing a list of musical notation attributes. The first staff has a green highlight under the first measure, which contains a rest. The callout box lists the following attributes:

- <rest> or <note>
- @dur = 4 or 8
- @pname = d
- @oct = 4

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, with a repeat sign at the end of the third measure.

Paso 5: Tercer compás

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 second staff is marked with a treble clef, a key signature of one sharp (F#), and a 3/4 time signature. The third staff is marked with a treble clef, a key signature of one sharp (F#), and a 3/4 time signature. 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 notes. The second staff is highlighted with a purple background. The score is divided into three measures, numbered 1, 2, and 3. The first measure contains the lyrics "La cu-ca-", the second measure contains "ra-cha, la cu-ca-", and the third measure contains "ra-cha". The lyrics are repeated in each measure. The score is marked with a piano (*p*) dynamic. The score is written in a standard musical notation style.

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. 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 staff is marked with a 'D' and a '1', the second with a '2', and the third with a '3'. The fourth staff is marked with a 'p'.

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, with measure numbers 1, 2, and 3 indicated above the staves. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha" repeated across the measures. The score is marked with a piano (*p*) dynamic.

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 with a green background. 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 standard musical notation with treble and bass clefs.

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 piano (*p*) dynamic and contains the lyrics "La cu-ca- ra- cha, la cu-ca- ra- cha". The second and third staves are highlighted in green and contain the same lyrics. The fourth staff also contains the lyrics. The score is divided into three measures, with the first measure starting with a treble clef and a key signature of one sharp (F#).

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

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 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 fourth staff is a bass line. The third staff is highlighted with a purple background. The lyrics are written below each staff, with hyphens indicating syllable placement. The piano part is marked with a *p* (piano) dynamic.

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

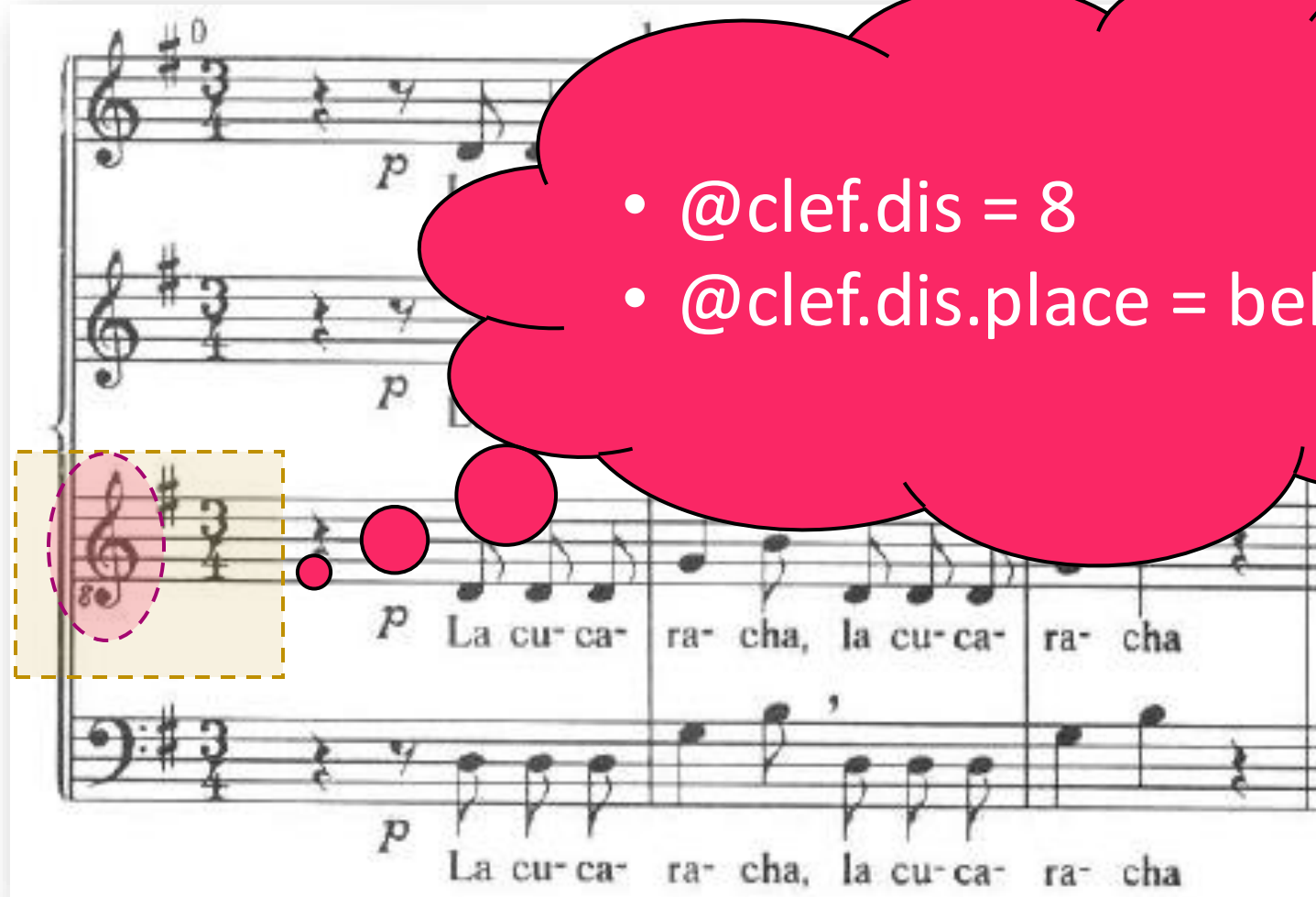
p La cu-ca-ra-cha, la cu-ca-ra-cha

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, featuring four staves. The first staff is marked with a piano (*p*) dynamic and contains the lyrics "La cu-ca-ra-cha, la cu-ca-ra-cha". The second staff also contains the same lyrics. The third staff is highlighted with a green dashed box and contains 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 divided into three measures, numbered 1, 2, and 3. The first measure is marked with a piano (*p*) dynamic. The second measure is marked with a piano (*p*) dynamic. The third measure is marked with a piano (*p*) dynamic. The score is written in treble and bass clefs, with a key signature of one sharp (F#).

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 features three staves: two treble staves and one bass staff. The lyrics 'La cu-ca-ra-cha, la cu-ca-ra-cha' are written below the staves. A pink cloud-shaped overlay contains two bullet points: '@clef.dis = 8' and '@clef.dis.place = below'. A yellow dashed box highlights the third staff, which has a treble clef and a key signature of one sharp (F#). A red dashed circle highlights the treble clef on the third staff.

- @clef.dis = 8
- @clef.dis.place = below

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, featuring four staves. The key signature is one sharp (F#). The score is divided into three measures, numbered 1, 2, and 3. The lyrics are "La cu-ca-ra-cha, la cu-ca-ra-cha". The first staff is marked with a piano (*p*) dynamic. The second staff is also marked with a piano (*p*) dynamic. The third staff is highlighted with a green dashed box and is also marked with a piano (*p*) dynamic. The fourth staff is marked with a piano (*p*) dynamic. The score is written in a standard musical notation style.

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

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

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

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

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

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)

The image shows a musical score for the song 'La cucaracha' in 3/4 time, key of D major. It features four staves. The first three staves are for vocal parts, and the fourth is for a bass line. A pink thought bubble is overlaid on the first three staves, containing the following text:

- @clef.shape = F
- @clef.line = 4

The fourth staff, which uses a bass clef, is highlighted with a yellow dashed border. A pink oval is drawn around the bass clef on this staff. The lyrics 'La cu-ca-ra-cha, la cu-ca-ra-cha' are written below the staves. The dynamic marking *p* (piano) is present at the beginning of each staff.

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

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UNIVERSIDADE NOVA DE LISBOA

¡Muchas gracias!

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