Português (Portugal) → Inglês ▾   ⋮   ╳

Informatics for Musicology (IPM) 2024/25

Jupyter Notebooks

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Summary Continued exploration of IPM (Haskell) libraries for 'Computer Aided Musicology'. Division of themes into sentences via functions such as `dcut` and `dchunksOf` . Operation `sel` for selecting and permuting the notes of a musical phrase. Series and their permutations. Examples and case studies.

⚠️ **Important** : run without moving the next cells.

In [ ]:
```
: opt  no - lint
: m  Data . Char
: m  Date . List
: m  Date . List . Split
: m  Data . Ratio
```

Modules developed for the discipline:

In [ ]:
```
: l  ../ src / Cp . hs
: l  ../ src / Reducer . hs
: l  ../ src / Ipm . hs
: l  ../ src / Abc . hs
```

Data ("case studies"):

In [ ]:
```
: l  ../ src / CS . hs
```

🔴Selection, division and cutting

10.1 - Consider the following fragment of the main theme of the last movement of the 1st symphony (opus 68)) by J. Brahms (1833-1897):

In [ ]:
```
brahms  =  abcPlay  "C"  "C"  ( 1 % 4 : quatern )
---
brahms  op68iv
```

What function f must be defined in the next cell to produce the melodic reduction `op68iv` shown in the figure?

In [ ]:
```
f  =  undefined
---
( abcPlay  "C"  "C"  ( 1 % 4 : quatern )  .  f )  op68iv
```

10.2 - Running and carefully analyzing the next cell, answer - what does the function do `dcut` ?

In [ ]:
```
( a , b )  =  dcut  4  op68iv
( c , d )  =  dcut  4  b
( e , h )  =  dcut  4  d
---
brahms  ( P  [ a , c , e , h ])
```

10.3 - In the previous cell we broke it `op68iv` into four parts `[a,c,e,h]` . But there is a quicker way to do the same using another function, as follows:

| Designation	Meaning	Detailed description
`dchunksOf`	divide into blocks	`dchunksOf d m` divides the melody `m` into a sequence of melodies ("phrases") according to the durations specified in `d`

Preview the results of the next cell before executing it:

In [ ]:
```
ms  =  dchunksOf  [ 4 , 4 , 4 , 4 ]  op68iv
---
length  ms
map  length  ms
---
brahms  ( P  ms )
```

10.4 - The next cell shows a famous theme - that of the Jupiter movement from *The Planets* by Gustav Holst (1874-1934):

In [ ]:
```
holst  =  abcPlay  "Eb"  "3/4"  ( 1 % 4 : tern )
---
holst  jupiter
```

Reproduce in the cell below the melodic reduction shown in the figure.
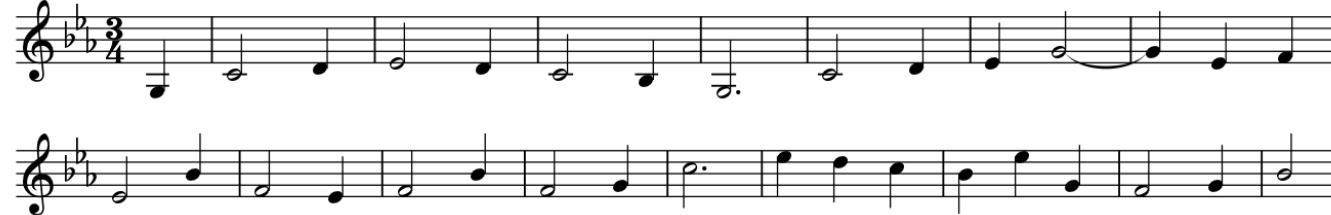
In [ ]:

10.5 - We now intend to visualize (and hear) the melody `jupiter` followed by itself an octave higher (as in Holst's original). Do this in the following cell:

In [ ]:

10.6 - Finally, as was done for `op68iv`, use to `dchunksOf` divide the topic `jupyter` into its four sentences:

In [ ]:

10.7 - The basic twelve-tone series of the first movement of the [violin concerto](#) by Alban Berg (1885-1935) is as follows:

which is listed below in a very practical way, using the function `unwords` that has already been studied before:

In [ ]:
```
berg  =  zip  ( words  "G, _B, D ^FA ce ^g =b ^c' _e' f'" )  una
---
berg
```

Analyze the cells below, indicating the difference between `nsort` and `sort`.

In [ ]:
```
( abcplease  .  nsort  .  collapse )  berg
```

In [ ]:
```
( abcplease  .  sort  .  collapse )  berg
```

10.8 - What is your interpretation (in the musical sense of the term) of the result of the following cells?

In [ ]:
```
( abcplease  .  chordify  tern )  berg
```

In [ ]:
```
( abcplease  .  chordify  tern  .  collapse )  berg
```

10.9 – Analyze the cell below, indicating what the function does `sel` .

In [ ]:
```
abcplease  ( sel  [ 2 , 1 , 4 , 3 , 6 , 5 , 8 , 7 , 10 , 9 , 12 , 11 ]  berg )
```

10.10 – Identify the sequence `s` that `sel s crom` gives the scale of whole tones (or their enamonics):

In [ ]:
```
crom  =  ( nsort  .  collapse )  berg
s  =  undefined
———
abcplease  ( sel  s  crom )
```

10.11 – Repeat the previous exercise to obtain a scale:

- only major thirds
- only minor thirds (or augmented seconds)

In [ ]:

In [ ]:

10.12 – Now pay attention to measures 142–145 of the last movement of the same work by Alban Berg:

(To hear)

That is:

In [ ]:
```
( abcPlayM  "Bb"  "C"  .  P )  [ berg1 , berg2 , berg3 , berg4 ]
```

Are all 12 notes from the above twelve-tone series being played in this fragment? Do "do the math" in the next cell to answer:

In [ ]: