

- **Mint** = Humdrum command for identifying intervals between successive notes in a melody (**Melodic INTerval**).

`cd ~/scores/nova` = change directory to work with Nova Scotian songs or download from:
<http://kern.ccarh.org/cgi-bin/ksdata?l=/users/craig/songs/creighton/nova&format=zip>

`mint nova022.krn` = run the mint command on nova022.krn

What is the most common interval in the song?

```
mint nova022.krn | rid -GLId | egrep -v '=[\[' | sort | uniq -c | sort -nr
```

Meaning of each step in the pipeline:

```
mint nova022.krn    == do the interval identification
| rid -GLId          == remove global comments (G:!!+), local comments (L:!),
                      interpretations (I:*), and null tokens (d).
| egrep -v '=[\['    == remove lines (-v) which contains "=" or "[" characters.
| sort               == sort the (remaining) lines in alphabetical order
| uniq -c            == count repetition of lines
| sort -nr           == sort the lines
```

The list also shows the direction of the interval. Try removing the interval direction:

```
mint nova022.krn | rid -GLId | egrep -v '=[\[' | sed 's/[+ -]//g' | sort | uniq -c | sort -nr
```

The added component:

```
sed 's/[+ -]//g'
```

removes all + and - characters from the text data passed to the sed program.

The editing operator is:

```
s/[+ -]//g
```

It must be wrapped in quotes so that the command-line does not try to look at the contents of the string and try to change if it sees special control characters (the quotes are not needed for this particular example). In the egrep command above, why does `'=[\['` need quotes?

Instead of sed, you can also use the `-a` option in mint which suppresses direction information:

```
mint -a nova022.krn | rid -GLId | egrep -v '=[\[' | sort | uniq -c | sort -nr
```

The `-d` option identifies only the diatonic part of the interval (2 = maj or min second, 3 = maj or min third). Try the following pipeline to count the total number of each diatonic interval type in all of the Nova Scotian songs:

```
mint -ad * | rid -GLId | egrep -v 'r|=[\[' | sort -nr | uniq -c | sort -nr
```

How does this compare to the songs in the ~/score/densmore/sioux directory?

- **Deg** = scale degree identifier

Mint specifies the interval between two notes, but another important aspect of the musical structure is the scale degree. Note that knowing only the melodic intervals can't be used to construct new melodies, you also need to know what sort of intervals are allowed on each scale degree.

```
cd ~/scores/nova
deg -at *.krm | rid -GLId | egrep -v '=|r' | sort | uniq -c
```

Deg can only be used on files which contain musical key indication, such as *G: for G major and *g: for g minor. The -k option can be used to specify a key from the command-line rather than reading it from the data file.

- **Semits** = convert melody into 12-tone interval intervals relative to first note.

Are melody pitches mostly found higher or lower (or neither) than the first note of the melody?

```
semits -tx *.krm | rid -GLId | egrep -v '=|r' | sort -nr | uniq -c
```

Examine the melac Humdrum command which requires semits output as its input.

New Humdrum Commands:

mint	= melodic intervals
rid	= remove Humdrum components
deg	= scale degrees
semits	= convert melody into 12-tone interval description

New Unix Commands:

egrep	= enhanced grep
sed	= stream editor

Remember:

- * Humdrum command with -h option will give a brief description of the command.
(or you can go to <http://humdrum.ccarh.org> which links to the online man-page for each Humdrum command).
- * Typing "man command" will give the manual page for a standard Unix command.

Links:

List of monophonic songs on kernscores:
<http://kern.ccarh.org/help/data#songs>