

NAME

semits — translate pitch-related representations to numerical semitones

SYNOPSIS

semits [-p *n*] [-tx] [*inputfile* ...] [> *outputfile.sem*]

DESCRIPTION

The **semits** command transforms various pitch-related inputs to corresponding numerical semitone values. It outputs one or more Humdrum ****semits** spines containing values corresponding to the semitone distance from middle C for pitch-related input tokens. Pitches above middle C produce positive output values, whereas pitches below middle C produce negative output values. For example, the ****pitch** token “C3” is transformed to -12 (semits).

The **semits** command is able to translate any of the pitch-related representations listed below. In each case, a tuning standard of A4 equals 440 hertz is assumed. For descriptions of the various input representations (including ****semits**) refer to Section 2 (*Representation Reference*) of this reference manual.

It is recommended that output files produced using the **semits** command should be given names with the distinguishing ‘.sem’ extension.

**cents	hundredths of a semitone with respect to middle C=0 (e.g. 1200 equals C5)
**freq	fundamental frequency (in hertz)
**fret	fretted-instrument pitch tablature
**kern	core pitch/duration representation
**MIDI	Music Instrument Digital Interface tablature
**pitch	American National Standards Institute pitch notation (e.g. “A#4”)
**semits	equal-tempered semitones with respect to middle C=0
**solfg	French solfège system (fixed ‘doh’)
**specC	spectral centroid (in hertz)
**Tonh	German pitch system

Input representations processed by semits.

OPTIONS

The **semits** command provides the following options:

- h** displays a help screen summarizing the command syntax
- p *n*** output precision of *n* decimal places
- t** suppresses printing of all but the first note of a group of tied ****kern** notes
- x** suppresses printing of non-semits data

Options are specified in the command line.

The **-p** option can be used to set the precision of the output values to *n* decimal places. The default precision is integer values only. Note that **semits** is able to process ****semits** as input; this feature allows the user to round-off existing ****semits** data to a specified precision.

The **-t** ensures that only a single output value is given for tied ****kern** notes; the output coincides with the first note of the tie.

In the default operation, **semits** outputs non-pitch-related signifiers in addition to the semits value. For example, the ****pitch** token “A5zzz” will result in the output “21zzz” — that is, after translating A5 to 21 semits, the “zzz” signifiers are retained in the output. For some applications, echoing non-pitch-related signifiers in the output is useful. However, in other situations, the result can prove confusing — especially, when the non-pitch-related signifiers are numbers. Consider the case of the ****kern** token “8aa”; after translating ‘aa’ to 21 semits, the non-pitch-related signifier ‘8’ will also be output, hence the value 821 — which will undoubtedly cause confusion. The **-x** option is useful for eliminating non-pitch-related signifiers from the output. For most ****kern** inputs, the **-x** option is recommended.

EXAMPLES

The following example illustrates the use of **semits**. The input contains six pitch-related spines — two of which (****deg** and ****cocho**) cannot be processed by **semits**. In addition, there are two non-pitch-related spines (****embell** and ****metpos**).

!! ‘semits’ example.

**kern	**pitch	**MIDI	**deg	**metpos	**cocho	**Tonh	**embell
*M2/4	*M2/4	*M2/4	*M2/4	*M2/4	*M2/4	*M2/4	*M2/4
*	*	*	*	*tb8	*	*	*
=1	=1	=1	=1	=1	=1	=1	=1
8ee-	G#4foo	/60/bar	1foo	1	r	Gis2	ct
.	.	/-60/	.	.	.	.	.
8ff	A3	/62/	2	3	9.89	H2	upt
.	.	/-62/	.	.	.	.	.
8dd-	Ab3	/70/	1	2	7.07	B2	ct
.	.	/-70/	.	.	.	.	.
8d-	C#4	/61/	6	3	7.135	Cis4	sus
.	.	/-61/	.	.	.	.	.
=2	=2	=2	=2	=2	=2	=2	=2
[4a-	r	.	5	1	r	r	.
.	.	.	7	3	5.5	Heses2	ct
4a-]	D4	/48/ /52/	1	2	8.11	C3	ct
.	.	/-48/	.	.	.	.	.
.	D4 F4	/-52/	2	3	7.33 6.4	C3 Es3	ct
=3	=3	=3	=3	=3	=3	=3	=3
r	G4	.	r	1	r	H2 D3	.
==	==	==	==	==	==	==	==
*-	*-	*-	*-	*-	*-	*-	*-

Executing the command

```
semits -tx input > output
```

produces the following result:

```
!! 'semits' example.
**semits  **semits  **semits  **deg  **metpos  **cocho  **semits  **embell
*M2/4     *M2/4     *M2/4     *M2/4  *M2/4     *M2/4     *M2/4     *M2/4
*         *         *         *      *tb8      *         *         *
=1        =1        =1        =1     =1        =1        =1        =1
15        8         0         1foo    1         r         -16       ct
.         .         .         .      .         .         .         .
17        -3        2         2       3         9.89      -13       upt
.         .         .         .      .         .         .         .
13        -4        10        1       2         7.07      -14       ct
.         .         .         .      .         .         .         .
1         1         1         6       3         7.135     1         sus
.         .         .         .      .         .         .         .
=2        =2        =2        =2     =2        =2        =2        =2
8         r         .         5       1         r         r         .
.         .         .         7       3         5.5       -15       ct
.         2         -12 -8    1       2         8.11      -12       ct
.         .         .         .      .         .         .         .
.         2 5       .         2       3         7.33 6.4   -12 -9    ct
=3        =3        =3        =3     =3        =3        =3        =3
r         7         .         r       1         r         -13 -10   .
=====
*-        *-        *-        *-     *-        *-        *-        *-
```

Both processed and unprocessed spines are output. Notice that the tied note at the beginning of measure 2 in the ****kern** spine has been rendered as a single note rather than as two notes (due to the **-t** option). Also notice that the non-pitch-related signifiers (e.g. foo) in the first notes of the ****pitch**, ****MIDI**, and ****cocho** spines have been stripped away (due to the **-x** option).

FILES

The file `x_option.awk` is used by this program when the **-x** option is invoked.

PORTABILITY

DOS 2.0 and up, with the MKS Toolkit. OS/2 with the MKS Toolkit. UNIX systems supporting the *Korn* shell or *Bourne* shell command interpreters, and revised *awk* (1985).

SEE ALSO

****cents** (2), **cents** (4), ****freq** (2), **freq** (4), ****fret** (2), ****kern** (2), **kern** (4), ****MIDI** (2), **midi** (4), ****pitch** (2), **pitch** (4), ****semits** (2), ****solfg** (2), **solfg** (4), ****specC** (2) **specC** (4), ****Tonh** (2), **tonh** (4)