

NAME

freq — translate pitch-related representations to frequency

SYNOPSIS

freq [-p *n*] [-tx] [*inputfile ...*] [> *outputfile.freq*]

DESCRIPTION

The **freq** command transforms various pitch-related inputs to corresponding frequency representations. It outputs one or more Humdrum ****freq** spines containing numerical values (in hertz) corresponding to the fundamental frequency for pitch-related input tokens. For example, the ****pitch** token “C4” is transformed to 261.63 (hertz).

The **freq** 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 ****freq**) refer to Section 2 (*Representation Reference*) of this reference manual.

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

**cbr	critical band rate (in equivalent rectangular bandwidth units)
**cents	hundredths of a semitone with respect to middle C=0 (e.g. 1200 equals C5)
**cocho	cochlear coordinates (in millimeters)
**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”)
**semit	equal-tempered semitones with respect to middle C=0 (e.g. -12 equals C3)
**solfg	French solfège system (fixed ‘doh’)
**specC	spectral centroid (in hertz)
**Tonh	German pitch system

Input representations processed by freq.

OPTIONS

The **freq** 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-frequency signifiers

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 two decimal places. Note that **freq** is able to process ****freq** as input; this feature allows the user to round-off existing ****freq** data to a specified precision.

The **-t** option 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, **freq** outputs non-pitch-related signifiers in addition to the frequency value. For example, the ****pitch** token “A6zzz” will result in the output “1760.00zzz” — that is, after translating A6 to 1760.00 hertz, 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 “8aaa”; after translating ‘aaa’ to 1760.00 hertz, the non-pitch-related signifier ‘8’ will also be output, hence the value 81760.00 — 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 **freq**. The input contains six pitch-related spines — one of which (****deg**) cannot be processed by **freq**. In addition, there are two non-pitch-related spines (****embell** and ****metpos**).

!! ‘freq’ 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

```
freq -tx input > output.freq
```

produces the following result:

```
!! 'freq' example.
**freq **freq **freq **deg **metpos **freq **freq **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
622.25 415.30 261.63 1foo 1 r 103.83 ct
. . . . .
698.46 220.00 293.66 2 3 481.97 123.47 upt
. . . . .
554.37 207.65 466.16 1 2 273.21 116.54 ct
. . . . .
277.18 277.18 277.18 6 3 277.16 277.18 sus
. . . . .
=2 =2 =2 =2 =2 =2 =2 =2
415.30 r . 5 1 r r .
. . . 7 3 187.76 110.00 ct
. 293.66 130.81 164.81 1 2 340.92 130.81 ct
. . . . .
. 293.66 349.23 . 2 3 289.24 234.47 130.81 155.56 ct
=3 =3 =3 =3 =3 =3 =3 =3
r 392.00 . r 1 r 123.47 146.83 .
=== === === === ===
*_ *_ *_ *_ *_ *_ *_
```

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

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