

# awk Quick Ref

compiled by v.ledos  
rel 1.0 feb-2010

## Usage

```
awk [-v var=val] 'program' [file1 file2...]  
awk [-v var=val] -f progfile [file1 file2...]
```

## Structure of an awk program

```
# comments  
pattern { action }           A sequence of  
pattern { action }           pattern-action  
...                           statements
```

For each file,  
  For each input line,  
    For each pattern,  
      If pattern matches input line, do the action.

"pattern"  
**BEGIN** : executes "action" before starting to view the input file  
**END** : executes "action" after ending to view the input file  
Other : regular, numeric or string expression or combination

"action" is executable code  
**if** (expression) statement1 **else** statement2  
**while** (expression) statement  
**for** (expr1;expr2;expr3) statement  
**do** statement **while** (expression)  
**break** / **continue** : immediately leave / start next iteration  
of innermost enclosing loop  
**exit** / **exit** expression : go immediately to the END  
action; if within the END action, exit program

## Built-in variables

\$0	Whole line,
\$1, \$2 ... \$NF	first, second... last field
ARGC	Number of command line arguments
ARGV	Array of command line arguments
FILENAME	Name of current input file
FS, RS	Input field / record separator (def: one space, \n)
NF	Number of fields in current record
NR, FNR	Number of record read so far / in current file
OFMT	Output format for numbers (default: %.6g)

OFS, ORS	Output field / rec. separator (def: one space, \n)
RESTART, RLENGTH	Start / Length of string matched by match function (see below)
SUBSEP	Subscript separator (default: \034)

## Main built-in functions

r: regex ; s,t: strings ; n,p: integers

<b>int</b> (n), <b>sqrt</b> (n), <b>exp</b> (n), <b>log</b> (n), <b>sin</b> (n), <b>cos</b> (n)	
<b>rand</b> ()	Random number between 0 and 1
<b>close</b> (file or command)	
<b>getline</b> [var]	Read next line from input file,
<b>getline</b> [var] < file	from a specific file,
command   <b>getline</b> [var]	or from a pipe
	Return 1 (record found), 0 (end of file), -1 (error)
<b>gsub</b> (r, s)	Substitute s for r globally in \$0 / string t;
<b>gsub</b> (r, s, t)	return # of subs made
<b>index</b> (s, t)	Return first position of string t in s, or 0 if t is not present
<b>length</b> (s)	Return number of characters in s
<b>match</b> (s, r)	Test whether s contains a substring matched by r; return index or 0; sets RSTART and RLENGTH
<b>split</b> (s, a)	Split s into array a on FS / field separator fs; return # of fields
<b>split</b> (s, a, fs)	
<b>sprintf</b> (fmt, expr-list)	Return expr-list formatted according to format string fmt
<b>sub</b> (r, s)	Substitute s for the leftmost longest substring of \$0 / t matched by r; return # of subs made
<b>sub</b> (r, s, t)	
<b>substr</b> (s, p)	Return substring of s (of length n) starting at position p
<b>substr</b> (s, p, n)	
<b>tolower</b> (s), <b>toupper</b> (s)	Lower and upper cases

## Formatted output

```
{ printf ("FORMAT",value1,value2,value3,...) }
```

%c	%s	Print as character, as string
%-8s		Print as 8 characters, left aligned
%f		Print as float number,
%6.2f		with 6 digits (4 as integer, 2 as decimal)
\n		Line feed and carriage return

## Operators

&&    !	Logical operators. Ex: !(\$2<4    \$3<20)
< <= == != >= >	Comparing operators
~ !~	matched by, not
selector?if-true-exp;if-false-exp	

## Basic programs

{ <b>print</b> NR, \$0 }	Precede each line by line #
{ \$1 = NR; <b>print</b> }	Replace first field by line #
{ \$2 = <b>log</b> (\$2); \$3 = "" ; <b>print</b> }	Replace the 2 <sup>nd</sup> field by its logarithm, zap field 3
NF > 0	Print non-empty lines
NF > 0 { <b>print</b> \$1, \$NF}	Print first field and last one of non-empty lines
NF > 4	Print records containing more than 4 fields
\$NF > 4	Print if last field greater than 4
NR%2==0	Print even-numbered lines
NR==10, NR==20	Print lines 10 to 20
/start/, /end /	Print lines between patterns
/regex/, EOF	Print from pattern to end of file
/regex/ { <b>print</b> \$1}	Print first field of lines matching regex
\$1 ~ /regex/	Print lines where first field matches
ORS=NR%5?"",""\n"	Concatenate every 5 lines of input, using comma separator
/regex/ {x++}	Count and print the number
<b>END</b> { <b>print</b> x}	of lines matching /regex/
{ nc += <b>length</b> (\$0) + 1; nw += NF }	
<b>END</b> { <b>print</b> NR, "lines", nw, "words", nc, "characters" }	wc command
{ sum += \$1 }	Print sum and
<b>END</b> { <b>print</b> sum, sum/NR }	average
{ x[NR] = \$0 }	
<b>END</b> { <b>for</b> (i = NR; i > 0; i--) <b>print</b> x[i]}	Reverse a file
{ a[\$1] += \$2 }	
<b>END</b> { <b>for</b> (i in a) <b>print</b> (i,":",a[i]) }	Group by field 1, and sum field 2
<b>function</b> pwr(a,b) { <b>return</b> exp(b*log(a)) }	
NF >= 2 { <b>print</b> pwr(\$1,\$2) }	User defined function
<b>BEGIN</b> { RS=""; FS="\n" }	Multi-line records.
{ <b>print</b> "Name: ", \$1	Leading and trailing
<b>print</b> "Address: ", \$2 }	newlines are ignored