

**NAME**

**test**, [ — validate textual, numeric, or file predicate

**SYNOPSIS**

```
test [!] ( expr ) [{ -a, -o } expr]...
test [!] string {=, !=, <, >} string, file { -ef, -nt, -ot } file [{ -a, -o }
    expr]...
test [!] -t fd, { -n, -z } string, { -e, -s, -f, -d, -c, -b, -p, -S, -O, -G, -r,
    -w, -x, -u, -g, -k, -N } file, { -h, -L } path [{ -a, -o } expr]...
test [!] integer { -lt, -le, -eq, -ne, -ge, -gt } integer [{ -a, -o } expr]...
test [!] string [{ -a, -o } expr]...
test
[ [!] ( expr ) [{ -a, -o } expr]... ]
[ [!] string {=, !=, <, >} string, file { -ef, -nt, -ot } file [{ -a, -o } expr]...
    ]
[ [!] -t fd, { -n, -z } string, { -e, -s, -f, -d, -c, -b, -p, -S, -O, -G, -r, -w,
    -x, -u, -g, -k, -N } file, { -h, -L } path [{ -a, -o } expr]... ]
[ [!] integer { -lt, -le, -eq, -ne, -ge, -gt } integer [{ -a, -o } expr]... ]
[ [!] string [{ -a, -o } expr]... ]
[ ]
```

**DESCRIPTION**

Exits with the result of the specified boolean expression. With no expression, exits false.

**Operators**

In chunked descending precedence, except all unary operators are equiprecedent; **-ao** left-associative.

True if:

( <i>expr</i> )	<i>expr</i>
! <i>expr</i>	<i>expr</i> is not true.
<i>expr</i> -a <i>expr</i>	Both expressions are.
<i>expr</i> -o <i>expr</i>	Either expression is.
<i>string</i> = <i>string</i>	The strings are identical.
<i>string</i> != <i>string</i>	The strings are <i>not</i> identical.
<i>string-l</i> < <i>string-r</i>	<i>string-l</i> is ordered before <i>string-r</i> in the current locale's collation sequence.
<i>string-l</i> > <i>string-r</i>	<i>string-l</i> is ordered after <i>string-r</i> in the current locale's collation sequence.
<i>file</i> -ef <i>file</i>	The files correspond to the same file — lie on the same device and point at the same i-node.
<i>file-l</i> -nt <i>file-r</i>	The modification time of <i>file-l</i> is earlier than that of <i>file-r</i> or if <i>file-l</i> exists but <i>file-r</i> doesn't.
<i>file-l</i> -ot <i>file-r</i>	The modification time of <i>file-l</i> is later than that of <i>file-r</i> or if <i>file-r</i> exists but <i>file-l</i> doesn't.
-t <i>fd</i>	File descriptor <i>fd</i> corresponds to a teletype.
-n <i>string</i>	<i>string</i> is <i>not</i> empty.
-z <i>string</i>	<i>string</i> is empty.
-e <i>file</i>	<i>file</i> exists.
-s <i>file</i>	<i>file</i> 's size is non-zero.

<b>-f</b> <i>file</i>	<i>file</i> is a regular file.
<b>-d</b> <i>file</i>	<i>file</i> is a directory.
<b>-c</b> <i>file</i>	<i>file</i> is a character device.
<b>-b</b> <i>file</i>	<i>file</i> is a block device.
<b>-p</b> <i>file</i>	<i>file</i> is a named pipe (FIFO).
<b>-S</b> <i>file</i>	<i>file</i> corresponds to a UNIX-domain socket.
<b>-h</b> <i>path</i> , <b>-L</b> <i>path</i>	<i>path</i> is a symbolic link.
<b>-O</b> <i>file</i>	<i>file</i> is owned by the process' effective user ID.
<b>-G</b> <i>file</i>	<i>file</i> is owned by the process' effective group ID.
<b>-r</b> <i>file</i>	<i>file</i> could be read by the process.
<b>-w</b> <i>file</i>	<i>file</i> could be written by the process.
<b>-x</b> <i>file</i>	<i>file</i> could be executed (searched) by the process.
<b>-u</b> <i>file</i>	<i>file</i> is set-user-ID.
<b>-g</b> <i>file</i>	<i>file</i> is set-group-ID.
<b>-k</b> <i>file</i>	<i>file</i> is sticky.
<b>-N</b> <i>file</i>	<i>file</i> 's modification time is after its access time.
<i>int-l</i> <b>-lt</b> <i>int-r</i>	<i>int-l</i> < <i>int-r</i>
<i>int-l</i> <b>-le</b> <i>int-r</i>	<i>int-l</i> ≤ <i>int-r</i>
<i>int-l</i> <b>-eq</b> <i>int-r</i>	<i>int-l</i> = <i>int-r</i>
<i>int-l</i> <b>-ne</b> <i>int-r</i>	<i>int-l</i> ≠ <i>int-r</i>
<i>int-l</i> <b>-ge</b> <i>int-r</i>	<i>int-l</i> ≥ <i>int-r</i>
<i>int-l</i> <b>-gt</b> <i>int-r</i>	<i>int-l</i> > <i>int-r</i>
<i>string</i> <b>-n</b> <i>string</i>	

## EXIT STATUS

- 0** The expression evaluated true.
- 1** The expression evaluated false.
- 2** Syntax error in expression or non-integer passed to **-t** or an arithmetic operator.

## EXAMPLES

A short, edited, idiomatic extract from `kernel-install(8)`:

```
#!/bin/sh
```

```
[ -z "$MACHINE_ID" ] && [ -f /etc/machine-id ] && read -r MACHINE_ID < /etc/machine-id
[ -z "$MACHINE_ID" ] && MACHINE_ID=Default
```

```
[ "$VERBOSE" -ge 3 ] && echo "Machine ID: $MACHINE_ID"
```

```
for suff in "$MACHINE_ID" "Default" "loader/entries"; do
    for pref in "/efi" "/boot" "/boot/efi"; do
        if [ -d "$pref/$suff" ]; then
            BOOT_ROOT="$pref"
            break 2
        fi
    done
done
```

```
if [ -z "$layout" ]; then
    if [ -d "$BOOT_ROOT/$MACHINE_ID" ]; then
        layout="bls-efi"
    else
        layout="legacy"
    fi
fi
```

```

    fi
fi

```

## SEE ALSO

expr(1), access(2), lstat(2), stat(2), isatty(3), inode(7)

## STANDARDS

Conforms to IEEE Std 1003.1-2024 (“POSIX.1”); **-O**, **-G**, **-k** are extensions; **-k** originates from CB-UNIX, **-N** from bash(1), the rest from the KornShell,

**()** and **-ao** conform to IEEE Std 1003.1-2008 (“POSIX.1”), are marked obsolete there and removed in IEEE Std 1003.1-2024 (“POSIX.1”), and for good reason — the expression grammar is very loose and easy to throw off with malicious input. Chain multiple **test** invocations with **&&** and **||** instead, though be wary of precedence (rather, the comparative lack thereof without an explicit **{ }**).

## HISTORY

Appears prototypically in Version 2 AT&T UNIX as **if(I)**:

```

NAME      if -- conditional command
SYNOPSIS  if expr command [ arg_1 ... ]

```

Supporting *exprs* of

```

-r file   true if the file exists and is readable.
-w file   true if the file exists and is writable
-c file   true if the file either exists and is writable, or does not exist and is creatable.
s1 = s2   true if the strings s1 and s2 are equal.
s1 != s2  true if the strings s1 and s2 are not equal.

```

grouped together with

```

!         unary negation operator
-a        binary and operator
-o        binary or operator
( expr )  parentheses for grouping.

```

With all sans **-c** as present-day, including **-ao** precedence.

The **BUGS** state:

"-c" always indicates the file is creatable, even if it isn't.

Version 3 AT&T UNIX removes **-c**.

Version 5 AT&T UNIX adds an *expr* of

```

{ command } The bracketed command is executed to obtain the exit status. Status 0 is considered
              true. The command must not be another if.

```

*command* taking arguments is undocumented. The **if** exclusion would hint at funny business, but there is none — everything up to the **}** is passed to **execv(2)** in the child, with the period-appropriate **PATH** emulation. This makes

```

if { whatever a b c } something q w e
essentially congruent with modern
if whatever a b c; then something q w e; fi

```

Version 7 AT&T UNIX makes **if** a reserved word in the shell, as present-day, and replaces **if(I)** with **test** supporting **()**, **!**, **-ao**, **=**, **!=**, **-tnzsfdrw**, **-lt**, **-le**, **-eq**, **-ne**, **-ge**, **-gt**, and the plain string. **-t**, when not followed by an argument, defaults to **-t 1**. **-lt**, **-le**, **-eq**, **-ne**, **-ge**, **-gt**, instead of integers, can be provided with **-l string**, resolving to the length of *string*.

CB-UNIX at or before version 2.3 adds **-xbugk** and drops **-l**.

CB-UNIX was, among others, the basis for AT&T System III UNIX, which sees the same implementation, but, curiously, only as a **sh(1)** built-in.

AT&T System V Release 1 UNIX adds **-p**. AT&T System V Release 4 UNIX adds **-h**, alters **-f** to match any non-directories if `/usr/ucb` is in the `PATH`.

4.4BSD adds all CB-UNIX operators, **-eph**, and **&|** as aliases for **-ao** to a Version 7 AT&T UNIX base.

Version 7 AT&T UNIX accepts being called as **[**, undocumented in the manual, but only if it takes up the whole argument **0** (is not preceded by a path).

CB-UNIX adds the **[ expr ]** syntax to the manual.

4.4BSD checks only the final character.

IEEE Std 1003.1-2008 (“POSIX.1”) requires checking the basename, previous standards are unclear.

IEEE Std 1003.1-2024 (“POSIX.1”) adds **-ef**, **-nt**, **-ot**, **-<**, **->**, as present-day, and removes **()** and **-ao**.