Title

all() — Element comparisons

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
<th>Remarks and examples</th>
<th>Conformability</th>
</tr>
</thead>
</table>

**Syntax**

\[
\text{real scalar all(real matrix } L) \\
\text{real scalar any(real matrix } L) \\
\text{real scalar allof(transmorphic matrix } P, \text{ transmorphic scalar } s) \\
\text{real scalar anyof(transmorphic matrix } P, \text{ transmorphic scalar } s)
\]

**Description**

all\(L\) is equivalent to \(\sum(!L) == 0\) but is significantly faster.

any\(L\) is equivalent to \(\sum(L) != 0\) but is slightly faster.

allof\(P, s\) returns 1 if every element of \(P\) equals \(s\) and returns 0 otherwise. allof\(P, s\) is faster and consumes less memory than the equivalent construction all\(P:==s\).

anyof\(P, s\) returns 1 if any element of \(P\) equals \(s\) and returns 0 otherwise. anyof\(P, s\) is faster and consumes less memory than the equivalent any\(P:==s\).

**Remarks and examples**

These functions are fast, so their use is encouraged over alternative constructions.

all() and any() are typically used with logical expressions to detect special cases, such as

\[
\text{if (any(x :< 0)) }
\]

\[
\text{...}
\]

or

\[
\text{if (all(x :>= 0)) }
\]

\[
\text{...}
\]

allof() and anyof() are used to look for special values:

\[
\text{if (allof(x, 0)) }
\]

\[
\text{...}
\]
or

    if (anyof(x, 0)) {
      ...
    }

Do not use allof() and anyof() to check for missing values—for example, anyof(x, .) because to really check, you would have to check not only . but also .a, .b, ..., .z. Instead use missing(); see [M-5] missing().

Conformability

all(L), any(L):

\[
L: \quad r \times c \\
result: \quad 1 \times 1
\]

allof(P, s), anyof(P, s):

\[
P: \quad r \times c \\
s: \quad 1 \times 1 \\
result: \quad 1 \times 1
\]

Diagnostics

all(L) and any(L) treat missing values in L as true.

all(L) and any(L) return 0 (false) if L is \( r \times 0 \), \( 0 \times c \), or \( 0 \times 0 \).

allof(P, s) and anyof(P, s) return 0 (false) if P is \( r \times 0 \), \( 0 \times c \), or \( 0 \times 0 \).

Also see

[M-4] utility — Matrix utility functions