

mindouble() — Minimum and maximum nonmissing value

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Description

`mindouble()` returns the largest negative, nonmissing value.

`maxdouble()` returns the largest positive, nonmissing value.

`smallestdouble()` returns the smallest full-precision value of e , $e > 0$. The largest full-precision value of e , $e < 0$ is $-\text{smallestdouble}()$.

Syntax

real scalar `mindouble()`

real scalar `maxdouble()`

real scalar `smallestdouble()`

Remarks and examples

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All nonmissing values x fulfill $\text{mindouble}() \leq x \leq \text{maxdouble}()$.

All missing values m fulfill $m > \text{maxdouble}()$

Missing values also fulfill $m \geq .$

On all computers on which Stata and Mata are currently implemented, which are computers following IEEE standards:

Function	Exact hexadecimal value	Approximate decimal value
<code>mindouble()</code>	<code>-1.fffffffffffffX+3ff</code>	<code>-1.7977e+308</code>
<code>smallestdouble()</code>	<code>+1.0000000000000X-3fe</code>	<code>2.2251e-308</code>
<code>epsilon(1)</code>	<code>+1.0000000000000X-034</code>	<code>2.2205e-016</code>
<code>maxdouble()</code>	<code>+1.fffffffffffffX+3fe</code>	<code>8.9885e+307</code>

The smallest missing value (`. < .a < ... < .z`) is `+1.0000000000000X+3ff`.

Do not confuse `smallestdouble()` with the more interesting value `epsilon(1)`. `smallestdouble()` is the smallest full-precision value of e , $e > 0$. `epsilon(1)` is the smallest value of e , $e > 1$; see [M-5] `epsilon()`.

Conformability

`mindouble()`, `maxdouble()`, `smallestdouble()`:
result: 1×1

Diagnostics

None.

Reference

Linhart, J. M. 2008. [Mata Matters: Overflow, underflow and the IEEE floating-point format](#). *Stata Journal* 8: 255–268.

Also see

[M-5] [epsilon\(\)](#) — Unit roundoff error (machine precision)

[M-4] [Utility](#) — Matrix utility functions

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