

## mindouble() — Minimum and maximum nonmissing value

Description	Syntax	Remarks and examples	Conformability
Diagnostics	Reference	Also see	

### 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

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.ffffffffffffX+3ff</code>	<code>-1.7977e+308</code>
<code>smallestdouble()</code>	<code>+1.000000000000X-3fe</code>	<code>2.2251e-308</code>
<code>epsilon(1)</code>	<code>+1.000000000000X-034</code>	<code>2.2205e-016</code>
<code>maxdouble()</code>	<code>+1.ffffffffffffX+3fe</code>	<code>8.9885e+307</code>

The smallest missing value (`. < .a < . . . < .z`) is `+1.000000000000X+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  $e$ ,  $e+1 > 1$ ; 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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