

NAG Toolbox

nag_machine_real_safe (x02am)

1 Purpose

nag_machine_real_safe (x02am) returns the **safe range** of floating-point arithmetic.

2 Syntax

```
[result] = nag_machine_real_safe  
[result] = x02am
```

3 Description

nag_machine_real_safe (x02am) is defined to be the smallest positive model number z such that for any x in the range $[z, 1/z]$ the following can be computed without undue loss of accuracy, overflow, underflow or other error:

$-x$

$1/x$

$-1/x$

\sqrt{x}

$\log(x)$

$\exp(\log(x))$

$y^{(\log(x)/\log(y))}$ for any y

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

None.

5.2 Optional Input Parameters

None.

5.3 Output Parameters

1: **result**

The result of the function.

6 Error Indicators and Warnings

None.

7 Accuracy

None.

8 Further Comments

None.

9 Example

See Section 10 in nag_machine_precision (x02aj).

9.1 Program Text

```
function x02am_example
fprintf('x02am example results\n\n');
fprintf('the real safe range parameter = %22.15e\n', ...
        x02am);
```

9.2 Program Results

```
x02am example results
the real safe range parameter = 2.225073858507202e-308
```
