
Subject: Arithmetic error from NR_MACHAR()
Posted by on Mon, 29 Jun 1998 07:00:00 GMT

[View Forum Message](#) <> [Reply to Message](#)

Hi all,

I tried to find out the machine precision on my LINUX PC with IDL 5.0.

The result is the following:

```
IDL> help, /struc, NR_MACHAR(/DOUBLE)
** Structure DMACHAR, 13 tags, length=68:
IBETA      LONG      2
IT          LONG      64
IRND       LONG      2
NGRD       LONG      0
MACHEP     LONG     -63
NEGEP      LONG     -64
IEXP        LONG      2
MINEXP     LONG    -1075
MAXEXP     LONG    -1073
EPS         DOUBLE   1.0842022e-19
EPSNEG     DOUBLE   5.4210109e-20
XMIN       DOUBLE   0.0000000
XMAX       DOUBLE      Inf
% Program caused arithmetic error: Floating divide by 0
```

It seems, that MAXEXP has got the wrong value.

Also XMAX, which is according to the manual calculated as
 $(1-EPSNEG) * IBETA^MAXEXP$, is Infinity, what may be the origin of the
error message.

But then I tried this:

```
IDL> prec = NR_MACHAR(/DOUBLE)
% Program caused arithmetic error: Floating divide by 0
IDL> print, (1-prec.EPSNEG)*prec.IBETA^prec.MAXEXP
0.0000000
```

There I dont get 'Infinity' as result, but '0.0'.

If, however, I try the same on a UNIX-system, first everything seems ok.

```
IDL> help, /struc, NR_MACHAR(/DOUBLE)
** Structure DMACHAR, 13 tags, length=72:
IBETA      LONG      2
IT          LONG      53
IRND       LONG      2
NGRD       LONG      0
```

MACHEP	LONG	-52
NEGEP	LONG	-53
IEXP	LONG	11
MINEXP	LONG	-1022
MAXEXP	LONG	1024
EPS	DOUBLE	2.2204460e-16
EPSNEG	DOUBLE	1.1102230e-16
XMIN	DOUBLE	2.2250739e-308
XMAX	DOUBLE	1.7976931e+308

But - if I calculate XMAX myself again - the result is 0.0:

```
IDL> prec = NR_MACHAR(/DOUBLE)
IDL> print, (1-prec.EPSNEG)*prec.IBETA^prec.MAXEXP
0.0000000
```

If I use MACHAR() instead of NR_MACHAR(), exactly the same happens.
The keyword DOUBLE also is not the origin of the problem.

Maybe anybody else understands, what happens?

Thanks,
Heiko

--

Heiko Hünenfeld

HASYLAB / DESY

Notkestr. 85
22603 Hamburg
Tel.: 040 / 8998-2698
Fax.: 040 / 8998-2787
e-mail: hhuenne@desy.de
